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THE TREATMENT OF MALIGNANT TUMORS BY REPEATED INOCULATIONS OF ERYSIPELAS: WITH A REPORT OF TEN ORIGINAL CASES.[1]

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In a paper published in the *Annals of Surgery*, in September, 1891, entitled "A Contribution to the Knowledge of Sarcoma," I referred at some length to the curative effect of erysipelas upon sarcoma, reporting the results of inoculation in three cases recently treated by myself.

At the time I began my investigations in this most interesting subject I had not read of Fehleisen's experiments in Germany. While collecting the cases of sarcoma treated at the New York Hospital during the past fifteen years, I found a case that, to my mind, had convincing evidence that erysipelas possessed a powerful curative principle antagonistic to sarcoma. (Fig. 1.)

Whether or not this principle could be isolated or utilized in the practical treatment of sarcoma was quite another question, yet one of sufficient interest and importance to lead me at once into making a thorough study of the subject.

Before going further it might be well to give a few points of interest in the case I have mentioned:

This was one of round-celled sarcoma of the neck, occurring in a German, aged thirty-one years. Five operations had been performed

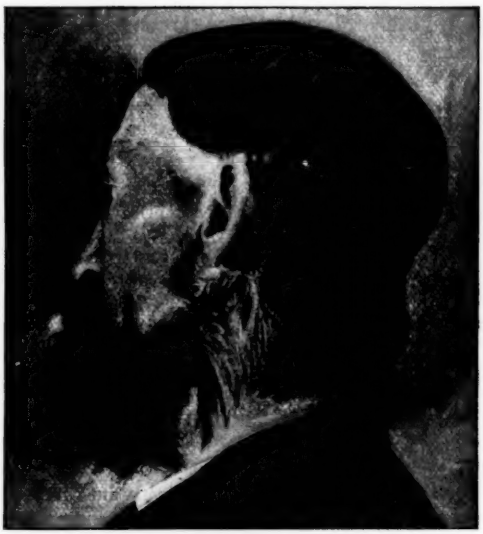
[1] Read (in part) before the Surgical Section of the New York Academy of Medicine, December 12, 1892.

by Dr. W. T. Bull within a space of three years. At the last operation it was found impossible to remove all of the tumor, and the case was considered hopeless.

Two weeks after the operation a severe attack of erysipelas occurred, followed by a second attack shortly after the first had subsided.

During the progress of the erysipelas the remains of the sarcoma entirely disappeared, the wound rapidly healed, and the patient was seen both by Dr. Bull and myself seven years afterward, at which time the photograph appended was taken.

FIG. 1.



Round-celled sarcoma of neck, cured by erysipelas. Photograph taken seven years after. (BULL'S case.)

The diagnosis in this case had been repeatedly confirmed by well-known pathologists, and there was no possibility of attributing the cure to any other cause than the erysipelas.

If erysipelas, a disease produced by a specific organism, could cure a case of undoubted sarcoma when occurring accidentally, it seemed fair to presume that the same benign action would be exerted in a similar case if erysipelas could be artificially produced.

Was it possible to produce an artificial erysipelas, and if so, what were its dangers and limitations? These were questions that immediately arose, and the answers to them, crude and imperfect though they be, I shall now endeavor to present.

In the course of a careful review of the literature of the subject I found that, aside from a vague and indefinite impression that tumors of doubtful character had been known to disappear after an attack of erysipelas, there was a certain amount of actual evidence. This evidence, though made up of facts few in number and scattered, was nevertheless strong.

It was made infinitely stronger by the publication of Fehleisen's paper in 1883, demonstrating the origin of erysipelas from a specific germ, and giving the results of a series of experiments upon five cases of malignant disease.

Having satisfied myself that the mortality from erysipelas uncomplicated was very small, I determined to inoculate the first case of inoperable sarcoma that should present itself.

I had but a short time to wait, and on May 2, 1891, I inoculated a case of sarcoma of the neck and tonsil (recurrent), which was kindly referred to me by Dr. Bull:

The patient was an Italian, thirty-five years of age, operated upon previously in Rome by Professor Durante, and in April, 1891, by Dr. Bull, at the New York Hospital. At the latter operation the growth was found too extensive to remove. At the time of my first inoculation the tumor of the neck was growing, and the right tonsil was the seat of a tumor the size of a hen's egg and almost completely blocking up the pharynx. Solid food could not be taken, and liquids frequently regurgitated through the nose.

The patient's condition was very bad. He was emaciated and cachectic. The dangers attendant upon an attack of erysipelas were explained to him, and in view of the hopelessness of his condition and the impossibility of obtaining further surgical relief, he consented to erysipelas inoculation.

The details of the earlier treatment are given in my former paper, and I will not repeat them here; suffice it to say that the inoculations were made by injecting small quantities of bouillon cultures ($\frac{1}{2}$ to 2 grammes) into the tumor itself, scarification (Fehleisen's method) having proved unsatisfactory.

The inoculations were continued at short intervals during May and a part of June. Slight local and constitutional reaction followed the inoculations, the tumor of the neck diminished in size, and the general condition improved. The tonsil tumor was also smaller and the voice much better.

During August and September the treatment was discontinued, and the tumors at once began to increase in size and the general condition to deteriorate.

October 1st they had reached their former size, and the patient's condition was little different from that at the time the inoculations were begun. At this time I succeeded in getting a culture of streptococcus erysipelatis kindly brought me by Dr. Farquhar Ferguson direct from Koch's laboratory, and I decided to make a further trial.

Five decigrammes of a fresh culture were injected into the tumor substance. Up to this time he had had no attack of true erysipelas, the

slight local reaction passing away in from twenty-four to forty-eight hours, and the temperature thereupon becoming normal.

Within an hour he had severe pain, nausea, vomiting, and a chill lasting forty minutes. His temperature rose to 105°, and within twelve hours a patch of perfectly typical erysipelas the size of the palm of the hand appeared upon the neck. This gradually extended over the face and head, and met upon the opposite side.

The disease ran the usual course, and I made little effort to check it, save to apply some ichthyol upon the forehead to prevent its extending to the scalp (which, I may add, it failed to do). At the end of ten days the pulse and temperature had become normal. The tumor of the neck began to break down on the second day, and discharged until the end of the attack. The discharge was not pus, but resembled the caseous material of a tubercular gland. The outlying nodules disappeared by absorption without breaking down. The tonsil tumor was smaller, but the diminution in size was not great. At the end of two weeks the tumor of the neck had disappeared, and there remained only the induration from the previous operations.

The appetite began soon to improve and he gained rapidly in flesh and strength. There has been up to the present time (twenty months) no return of the tumor in the neck, and although the tonsil tumor has remained about the same in size, its malignant character must have been greatly modified, as sarcoma of the tonsil is known to be rapidly fatal.

The patient's general condition at present (nearly two years) is very good, although he is suffering from a confirmed morphine habit which he had contracted previous to the inoculations.

My second and third cases were bone sarcomata (periosteal), one of the lower end of the femur and the other of the upper dorsal spine. These two cases are, as far as I have been able to ascertain, the only cases of bone tumors where inoculation has been tried; although Dr. Gerster reported at the Surgical Society, a year ago, a most remarkable case of sarcoma of the lower end of the femur, with amputation at the trochanter minor, followed by rapid recurrence in the stump. An attack of accidental erysipelas ensued a few weeks later, whereupon the tumor entirely disappeared, and the patient was seen by Dr. Gerster three years afterward, free from recurrence.

The results in my two cases, although temporarily beneficial, were not successful from a curative point of view. It is worthy of note, however, that in neither case was erysipelas obtained. The reaction, both local and constitutional, resembled exactly that which occurred in the early treatment of the first case; and the slight improvement compared with that which I have observed after true attacks of erysipelas, has led me to regard the presence of the streptococci themselves as a very important factor in destroying the neoplasm. My own experiments in the use of sterilized cultures of erysipelas, as well as the recent researches of Stronck, still further confirm this view.

My fourth case was a very large inoperable carcinoma of the face involving the entire left side and adherent to the bony structure. The patient was seventy-five years of age and had been treated at the New York Hospital for several weeks with pyoktanin injections (150) without any improvement.

I inoculated him in May, 1891, with a bouillon culture of the same stock that I had used in my first case. Slight local and considerable constitutional reaction followed, the temperature rising to 102½° and accompanied by some nausea and vomiting. The reaction occurred ten hours after inoculation, and subsided in forty-eight hours. The inoculations were discontinued after three injections, owing to inability to treat the patient at his home or to obtain a suitable place in a hospital.

The effect of the inoculations upon the tumor was not apparent beyond a slight softening. In this case, as in the two preceding ones, there was no real erysipelas produced.

CASE V. *Very large sarcoma of the back; recurrent; inoculation with erysipelas; failure to produce erysipelas.*—The patient was a man aged forty-five, a carpenter by trade, without history of hereditary taint, and who had always been well until three years before, when, without any injury, a swelling appeared over the right scapula. At the end of one and a half years it had reached the size of a cocoanut, and was removed at St. Luke's Hospital by Dr. Francis H. Markoe.

Recurrence took place four months later, but the patient delayed coming back to the hospital until February, 1892, at which time the tumor had become inoperable. It occupied the entire mid-scapular region, and its semi-circumference vertically and transversely was 17½ and 18½ inches.

Through the kindness of Dr. L. Bolton Bangs and Dr. Markoe, the case was referred to me with a view of trying erysipelas.

The cultures which I had used the previous fall had become too attenuated and I was unable to obtain any fresh ones. The patient was kept two weeks in the erysipelas ward of Bellevue Hospital, and although surrounded by patients in all stages of erysipelas, and inoculated repeatedly by direct means, it was found impossible to produce erysipelas, and he was discharged.

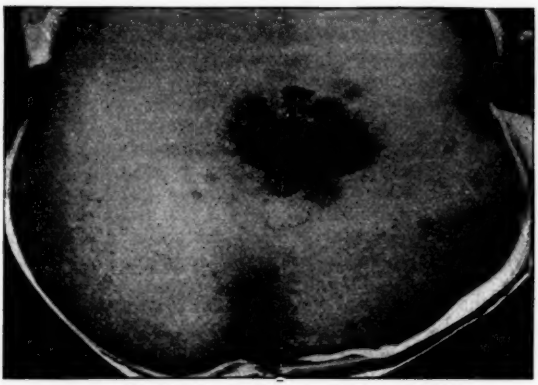
CASE VI. *Large sarcoma of back and groin; operation (groin tumor), recurrence in four weeks; erysipelas inoculation; entire disappearance of both tumors; recurrence three months later; second inoculation; second disappearance; recurrence in back, not in groin.*[1]—The patient, a German, forty six years of age, cigar-maker, with a good family and personal history, applied at the Hospital for Ruptured and Crippled early in January, 1891, for treatment for a swelling in the right groin.

At that time there was a tumor the size of a goose-egg—hard, slightly nodular, deeply seated in the region of the inguinal glands without any signs of an inflammatory nature. Hernia could easily be excluded, and the usual causes of an adenitis were absent. The patient had first noticed the tumor five months before; it had slowly but steadily increased in size, and was slightly painful. I made the diagnosis of malignant disease, in spite of the fact that careful questioning failed to elicit any history of a primary tumor elsewhere. A few days later I operated

[1] As this is, perhaps, the most interesting and suggestive of my cases, I give it somewhat in detail.

upon the tumor of the groin, at the Post-Graduate Hospital. The tumor was found to consist principally of degenerated glandular tissue, but no pus was present. The microscopical examination was unsatisfactory. While putting on a spica bandage I discovered a large flat tumor in the lumbar region of the back, measuring six inches by four, elliptical in shape, and projecting from the normal surface about one-half to one-inch. It was very hard and nodular, presenting numerous tuberosities. Its color varied from a bright red to a plum color. It was freely movable, and was evidently situated entirely in the skin and subcutaneous tissue. The patient stated that it had been there five years, but having caused him little inconvenience, he had paid slight attention to it. In

FIG. 2.



Sarcoma of back and groin. Entire disappearance after erysipelas inoculation. (COLEY.)

fact, his knowledge of pathology was so crude that he had regarded it as "simple hemorrhoids," his idea of the latter disease having been gained from an afflicted friend.

Other than an indefinite history of injury in the army in 1870, no cause could be found for the tumor.

Soon after leaving the hospital Dr. Geo. H. Fox kindly saw the case with me, and his diagnosis was sarcoma of the skin. A photograph was taken at the time, February, 1891, shown in the accompanying cut.

Shortly afterward I removed two sections of the tumor under cocaine, for microscopical examination, and the diagnosis of sarcoma was confirmed by the careful examination of Dr. Farquhar Ferguson, the pathologist of the New York Hospital. At this date, February, 22, 1892, the tumor of the groin had already recurred and was growing rapidly. The tumor of the back was also increasing in size. In view of the rapid recurrence in the groin and the large size of the tumor of the back the patient was advised, both by Dr. Bull and myself, to have erysipelas tried. After some deliberation he consented, and on the 21st of April, 1892, I began inoculations.

I inoculated him, as in the preceding case, with bouillon culture injected into the tumor itself, using in this case a freshly prepared culture, kindly furnished me by Dr. T. M. Cheesman, of the laboratory of the College of Physicians and Surgeons of this city, from material which I had obtained from a recent case of erysipelas.

During the first three weeks of treatment the inoculations were made at intervals of two to three days. Well-marked constitutional reaction followed, accompanied by slight local redness at site of puncture; the condition returning to normal at the end of twenty-four to forty-eight hours. The effect on the tumor was a perceptible decrease in size; there was no formation of pus, nor was there any breaking down of the tumor tissue. At the beginning of the fourth week I used a new culture sent me from the laboratory of the Johns Hopkins Hospital. The first injection of 7 decigrammes produced a reaction quite similar to that obtained from the other culture. The second, of 1½ grammes, two days later, produced a perfectly typical attack of erysipelas, both in the back and groin (injections having been made in both places).

Four hours after the inoculation the patient had a very severe chill, with nausea and vomiting and marked prostration. The temperature rose to 105½°, and the pulse to 130°. The subsequent history was that of a typical but severe attack of erysipelas. The disease did not extend over a very large area, although no measures were taken to check it.

From the beginning of the attack the change that took place in the tumor was nothing short of marvellous. It lost its lustre and color, and had shrunk visibly in size within twenty-four hours. Several sinuses formed the second day and discharged necrosed tumor tissue. A few days later the tumor of the groin, which was about the size of a goose-egg, and very hard, when the inoculations were begun, broke down and discharged a large amount of similar material.

This continued for two weeks, after which time the sinuses gradually closed. The most projecting portion of the tumor of the back ulcerated over an area one and a-half inches in diameter, but this rapidly healed.

Three weeks from the date of the attack both tumors had *entirely disappeared*, and there was scarcely any induration remaining. His recovery from the erysipelas was retarded somewhat by an unusual complication.

During the early part of the inoculation treatment (before the attack of erysipelas) he received a blow upon the chest while scuffling with another patient. Four weeks later, when recovering from the erysipelas, he began to feel pain in the region of the injury, and soon after a diffuse swelling appeared.

The temperature ranged from 101° to 102½° for a week, and the swelling gradually increased in size. There was no redness, but fluctuation could be detected, and a needle introduced in the mammillary line between the fourth and fifth ribs drew thick creamy pus.

The following day I made an incision under cocaine anæsthesia, and found a large abscess connecting with the pleural cavity and lung itself, as shown by the passage of air through the wound, and the fact that the patient for several days (before and after operation) expectorated a large amount of purulent material, exactly like that found in the abscess. About ten ounces of pus was evacuated, the cavity washed out, and a drainage-tube inserted. The tube was withdrawn at the end of ten days, and the sinus had entirely closed two weeks later.

The patient's general condition improved rapidly. He gained seven pounds in twelve days. There was no recurrence of the tumors until July 1st, when a small nodule, the size of a pea, appeared at the site of former tumor in the back.

July 18th there were six small nodules within an area of from two to four inches, the largest of which was seven-eighths of an inch in diameter.

July 3d inoculations were begun again, but no reaction was obtained until July 19th, when one gramme of a culture sixteen days old, fifth generation, produced a chill eight hours later, followed by a rise of temperature to 103½°. After two days a small sinus formed and necrosed tumor tissue came away.

One nodule, which was seven-eighths of an inch in diameter when the injection was made, disappeared at this time, but the effect on the rest of the nodules was only a temporary check. They grew rapidly afterward, and by October 1st had coalesced, forming a flat tumor similar to the original one, and measuring two and a half by four and a half inches. The nodules had also reappeared in the right groin. The patient was sent to the New York Cancer Hospital Cottage in order to have the erysipelas inoculations more systematically carried out. He was given injections of ½ to 2 grammes (of bouillon culture of the same stock as that used in the spring) every other day for two weeks. I could not produce an erysipelas, and the slight reactions failed to diminish the size of the tumor, although they checked its growth.

At this point I succeeded in getting a new and virulent culture from a case of uncomplicated facial erysipelas, seen on the day of its development, before treatment.

The fact that the temperature was 106½° the first day of the disease made me hopeful that could I succeed in isolating them, the streptococci would be virulent. I made cultivations upon five tubes of agar-agar, and succeeded in getting pure cultures in two of them. These I first tested upon rabbits, and then proceeded to use them in the case I am describing.

The first injection was made October 23, 1892; 7 decigrammes, second generation, six days old, of a bouillon culture were injected into the tumor. A severe chill occurred three hours later, and the temperature rose to 104½°. October 24th the temperature had fallen to 101½°, and as there was no evidence of erysipelas in the vicinity of the inoculation a second injection of 7 decigrammes was given October 25th. The temperature remained normal. November 5th, 2 grammes of a culture ten days old (second generation) was followed by a severe reaction, and a temperature of 104½°, which, however, fell to 100° in six hours.

From October 23d to November 14th the inoculations were kept up at short intervals, and followed by the results just described. The tumor was slightly diminished in size, but grew rapidly as soon as the inoculations were stopped.

November 14th. Careful measurements were taken of the tumor of the back, and were as follows: 5 by 3½ inches, with ½ by ¾ inch projection.

An injection of 1½ grammes two weeks old, of exactly the same culture tube as that used at the previous inoculation, was followed by a chill fourteen hours after, and a rise of temperature to 105°. A patch of

erysipelas soon appeared (some distance from the point of inoculation), and the disease ran a typical course, lasting a week.

The area of erysipelas never exceeded eighteen inches in diameter, and was chiefly confined to the right buttock. No attempt was made to limit it. The temperature, after the first day, ranged between 101° and 103½°, and at no time was the condition serious

The changes produced by this attack of erysipelas were no less remarkable than those that occurred during the former. Within twelve hours of the onset the tumor became dull and lustreless, and began to break down and soften.

Four or five sinuses formed, from which degenerated tissue escaped during the entire course of the erysipelas. At the end of thirty-six hours the tumor had diminished one-half, and at the end of a week there was nothing left save slight thickening and induration at the site of the tumor. The nodules in the groin had entirely disappeared.

Two weeks later (December 1, 1892), the induration in the back had perceptibly increased, and several suspicious-looking places had appeared on the surface, showing that the tumor had not been entirely destroyed.

December 7th. The nodules had increased rapidly in size, and injection of 1 gramme, second generation, twenty days old, was given.

Scarification and multiple punctures were also tried on the normal skin near the tumor.

The inoculation was done at 10.30 A.M. At 1 P.M. there was malaise and headache, nausea and vomiting at 2 P.M., and at 3 P.M. the temperature was 105.° At 8 P.M. it was still 105$\frac{2}{10}$°, and pulse 140. It had fallen to 101½° the following morning (December 8th), and there was no evidence of a new attack of erysipelas, although the tumor was smaller.[1]

CASE VII. *Sarcoma of the breast; seven recurrences; inoculation of erysipelas; partial disappearance of the tumor; recurrence; operation; inoculation repeated. (Still under treatment.)*—F. P., thirty-eight years of age, single; first noticed a tumor in the left breast five years ago. Her family and personal history was good, and she had no recollection of having injured the breast.

It grew steadily, and was somewhat painful. Several physicians and surgeons were consulted, and all considered it a cystic adenoma, and advised letting it alone.

In September, 1889, it showed undoubted features of malignancy, and was removed by Dr. Webber, of Cleveland, Ohio. It recurred four months later, and in five weeks had reached the size of an orange. The subsequent history up to the time I first saw her (June 1, 1892) was simply a repetition of operation and recurrence.

The seventh operation was performed by Dr. Bull, at St. Luke's Hospital, in April, 1892, at which time a large tumor was removed. Recurrence took place before the wound had healed, and June 1st the growths had reached the size indicated in the figure. (Fig. 3.)

In view of the hopelessness of benefit from further operation, the erysipelatous treatment was suggested to her by Dr. Bull, and she decided to have it tried. She was transferred to the New York Cancer Hospital Cottage, which was kindly placed at our disposal by the board,

[1] A week later, a spontaneous attack of erysipelas occurred in the same region as the last; and during the three weeks following, two similar attacks occurred, though milder in type.

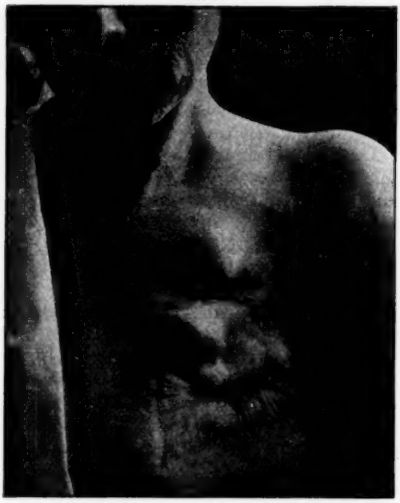
and June 2, 1892, the first inoculation was made by Dr. Bull and myself.

There were three separate tumors present in the left mammary region, 1½ inches, 2 inches, and ¼ inch in diameter, respectively.

The two larger ones were fixed to the chest-wall.

One and a half grammes of a culture five weeks old was injected into each of the two larger tumors, at 9 P.M., June 2, 1892. Temperature before injection was 98½° Two hours later there was intense pain, followed by a chill lasting more than an hour. At 3 A.M. the temperature had risen to 104.2°. The patient had severe vomiting and purging.

FIG. 3.



Recurrent sarcoma of breast. (COLEY.)

The next day, June 3d, there was an erysipelatous blush, extending seven inches across toward the right side. The disease ran the usual course, and at the end of a week the temperature had fallen to normal. The tumors broke down on the second day and discharged degenerated tissue, as in the preceding cases. The tumors decreased very much in size, one of them almost disappearing. They soon began to grow again, and others appeared in neighboring parts.

The inoculations were repeated, but a second attack of erysipelas was not produced until July 2d.

June 30th. At this time the lower tumor was scraped out with a sharp spoon under cocaine, and ten minims of culture, two weeks old, put into the wound. Twenty-six hours later she vomited and had chilly sensations, but no distinct chill. The temperature was 99.4°, and steadily rose until 12 M., July 4th, when it had reached 104°. It remained high for several days, reaching 105° in two days.

The erysipelas spread over a considerable portion of the back and down the left arm to the hand.

The temperature did not fall to normal until the eleventh day of the disease.

Although all of the nodules were diminished in size and some even disappeared, the check proved but temporary, and they soon began to increase in size.

Although the last attack of erysipelas was a severe one, the recovery was very rapid, and the general condition was soon as good, if not better, than before the attack.

The tumors grew very rapidly and were exceedingly painful. In October there were three distinct tumors, the largest of which was as large as a cocoanut, without ulceration, very soft, almost cystic in feel. There was a second tumor, as large as a large orange, a fungoid mass with a small pedicle.

Both of these were removed by operation in the latter part of October, and the large areas left uncovered by skin healed with remarkable rapidity.

She has gained considerable weight and strength, and there now remains a tumor the size of half an orange, which has been treated by repeated inoculation the past two weeks. The growth has been checked, but the tumor has not decreased in size.

I have not yet been able to produce a third attack of erysipelas in this case.

The general condition is better than last June, and there is no evidence of general dissemination.[1]

CASE VIII. *Recurrent carcinoma of the breast; repeated inoculations of erysipelas; diminution in size of tumor; improvement temporary.*—The tumor occurred in a woman forty years of age, who was married and had had children. Predisposing causes were to be found in a family history of cancer, and also in a personal history of mastitis. The tumor was first noticed one and a half years before. Four operations had been performed within less than a year. The tumor at the time of inoculation was the size of a goose-egg, 5 by 3 inches, and occupied the upper part of the region of the left breast. The growth was markedly protuberant and ulcerated over an area the size of a silver half-dollar. A thin, serous discharge, very profuse, necessitated frequent dressings. There was also a hard tumor, the size of an egg, adherent to the skin on the right breast, which was unmistakably carcinoma.

Inoculations were begun August 1, 1892, and continued at short intervals for two months. Moderate constitutional reactions followed the injections, and there was partial degeneration of the tumor, and considerable diminution in its size. The general condition of the patient was perfect, and not perceptibly the worse from the treatment. The reaction usually passed away in twenty-four to forty-eight hours, and the patient was able to be up and out most of the time. I did not succeed in producing a true attack of erysipelas, although I used the same cultures as in the preceding case.

The inoculations were discontinued in the early part of October, and the tumor began soon to increase in size.

CASE IX. *Recurrent carcinoma of the cervical glands; repeated inoculations; partial degeneration of tumor.*—The patient was a man, fifty-five

[1] March 8, 1893. The patient's general condition is about the same. She is being treated with injections of the toxic products of erysipelas.

years old, operated upon by Dr. Frank Hartley for a large carcinoma of the neck in July, 1892, with rapid recurrence following.

He was treated for three weeks in October, 1892, at the New York Cancer Hospital Cottage, with repeated inoculations of a pure culture of erysipelas.

Marked reaction followed, but erysipelas was never produced.

The larger tumor (small egg) broke down, and for several days there was considerable discharge of degenerated tissue, and the tumor decreased in size about one-third. Failing to produce erysipelas, I advised further operation with a view of trying the erysipelas from new virus in the event of recurrence.

CASE X. *Large carcinoma of inguinal glands following amputation of carcinomatous penis one year before; repeated inoculations; temporary improvement.*—The history of this case, as far as the erysipelas is concerned, is almost exactly parallel to the one just described. The tumor was the size of an orange, in the right inguinal region. The patient was seventy-five years of age, and very feeble, having chronic bronchitis and a weak heart. I did not succeed in giving him erysipelas, yet partial degeneration of the tumor followed the repeated injections of the streptococci.

The treatment was discontinued, owing partly to his weak condition and to the attenuated condition of the virus.

In addition to these cases of my own, I have collected and tabulated all the reported cases of carcinoma and sarcoma in which erysipelas, either spontaneous or artificial, intervened. It is upon a careful study and analysis of these cases, as well as upon the more practical experience derived from my own cases, that my conclusions are based.

Time will not permit me to go into these cases in detail, and I can do nothing more than give a brief summary of the results.

We find a total of 38 cases of malignant disease in which an erysipelas has occurred, either by accident or intent.

Of these 38 cases the erysipelas occurred accidentally in 23 cases, and was the result of inoculation in 15 cases (including my own); 17 cases were carcinoma, 17 cases were sarcoma, 4 either sarcoma or carcinoma.

The immediate and final results were as follows:

Carcinoma. Of the 17 cases, 3 were permanently cured. In addition, 1 case of probable carcinoma (Hutchinson's) was well five years after the attack of erysipelas. Of the remaining 13, 10 showed improvement, which, although temporary, undoubtedly added to the life of the patient in most cases. One case (Janike's) died, as a result of the erysipelas, on the fourth day.

Sarcoma. In turning to sarcoma we find the curative action of the erysipelas even more marked. Of the 17 cases of sarcoma we find 7, or 41 per cent., well and free from recurrence from one to seven years after the attack of erysipelas. Nearly all of these 7 cases have a remarkable history. The cases of Dr. Bull, Dr. Gerster, and my own have already been described.

The remaining 4 were as follows: The first (Biedert's) was a

very large round-celled sarcoma, involving mouth, face, nose, and orbit of a child ten years of age. The features were greatly distorted, and the general condition so bad that death from exhaustion was anticipated soon. While in daily expectation of being obliged to do a tracheotomy, a severe attack of facial erysipelas occurred. The tumor disappeared, as if by magic, during the course of the erysipelas. The child recovered, and at the end of a year was perfectly well, with no trace whatever of recurrence.

The next case (Brun's) was a melanotic sarcoma of the breast, with entire disappearance, and no recurrence.

The sixth case (Busch's) was a multiple sarcoma of the face that entirely disappeared after an attack of facial erysipelas, and did not return.

The seventh case (Kleeblatt's) was a lympho-sarcoma of the neck, very large; the erysipelas in this case being the result of inoculation.

In addition to these seven cases there is one other, a probable sarcoma of the breast, that was cured.

Ten of the remaining eleven showed more or less marked improvement; in some cases the tumor entirely disappearing, and not recurring for several months.

One case died as a probable result of the erysipelas, which was in this instance accidental.

To put the result still more briefly: In carcinoma, 17 cases, 3 cures, 17.6 per cent.; 1 death, 5.9 per cent. In sarcoma, 17 cases, 7 cures, 41 per cent.; 1 death, 5.9 per cent.; 4 sarcoma or carcinoma, 2 cured.

These cases have been in no way selected, and I have made every effort to include all cases resting upon competent authority, yet it might be urged as an objection to accepting these figures as representing the true percentage of cures, that cases have probably occurred which, owing to no marked improvement following the erysipelas, naturally failed to be reported. This objection, though valid as far as the accidental cases are concerned, would cease to hold in the cases of inoculation for the reason that, being so few in number, all, or nearly all, have probably been reported.

Grouping by themselves, then, the cases where the erysipelas was artificially produced, we find 7 cases of carcinoma, 1 cure, or 14.3 per cent., and 8 cases of sarcoma, 2 cures, 25 per cent. These cases were as follows: Fehleisen, 2; Kleeblatt, 2; Busch, 1; the remaining 3 cases being my own.

These figures may then be taken to fairly represent the curative effect upon carcinoma and sarcoma in the worst cases; and when we reflect that in nearly every instance the tumor was not a primary growth, amenable to operative treatment, but either a recurrence after operation had been tried and failed, or from its nature inoperable, then and then

only are we in a position to fully estimate the importance and value of erysipelas as a *curative* agent.

I have purposely excluded in the foregoing analysis 8 cases of my own treated by *repeated injections* of erysipelas cultures, which, without producing erysipelas, caused marked improvement in the tumors. These cases should be grouped by themselves, and they bring us back to the question regarding the nature of this *curative principle*, which, however variable its action, must be regarded as having a constant relation to erysipelas.

In my former paper I referred briefly to the different theories offered in explanation of this benign action, and even then I was inclined to believe it due to "antagonistic bacterial action," the neoplasm being regarded as dependent upon some unknown micro-organism.

Since that time the evidence in favor of the micro-parasitic origin of cancer has been steadily and rapidly accumulating until at the present moment it rests little short of absolute demonstration. Time will not permit more than a brief mention of the more salient points of this evidence, yet since a proper appreciation of its character and strength is necessary to anything like a clear understanding of the probable action of erysipelas upon malignant tumors, we cannot pass over it unnoticed. We shall consider:

1. *The close resemblance of cancer to other diseases known to be of bacterial origin.* The striking analogy between cancer and tuberculosis was noticed long before the tubercle bacillus was discovered. Sir John Simon in 1877 clearly pointed out this analogy, and in fact even then argued very strongly in favor of a micro-parasitic origin of cancer. His paper states the points at issue so clearly and briefly, and moreover the facts adduced and the conclusions drawn—showing as they do an almost prophetic insight—make it a paper that can be read with the greatest interest and profit to-day. He pointed out the error in the earlier investigations in allowing the "anatomical forms," interesting enough in themselves, to obscure the more important "property of infectiousness," which he regarded as the "real puzzle" of the disease. "The anatomical forms are matters of mere local accident, but the infectiousness of cancer represents its very cause." He showed that the element of heredity plays an entirely different rôle in cancerous and non-cancerous tumors; that while in the latter the hereditary influence often seems to be the *entire* cause of the tumor, an "embryonic fault" belonging to the same pathological class as supernumerary toes and fingers—in *cancer* it supplies only that portion of the cause which, as in tuberculosis, is familiarly known as *predisposing conditions*. This opinion we know is generally accepted at the present day. There is, moreover, a growing tendency to no longer adhere to the stereotyped classification of "tumors," and we venture to predict that in the near

future, instead of "tumors," a class at present embracing elements without the remotest analogy either in their etiology or mode of development, we shall have two main groups—the first of which might be designated as *congenital hypertrophies;* the second, *neoplasms,* etiologically dependent upon infection from without.

This statement may seem a trifle strong, since Cohnheim's embryonic theory of the origin of cancer is not only still held by the larger body of medical men, but has quite recently been championed by Baumgarten in Germany as well as by distinguished pathologists in this country. In spite of all the objections and criticisms, the micro-parasitic theory has steadily gained ground, and just now the confirmations are rapidly outnumbering the objections. These objections, the most of which were formulated by Cohnheim himself, ten years ago, have nearly all been answered. He argued that cancer could not be of microbic origin, first, because it was neither epidemic nor endemic. Tuberculosis is neither epidemic nor endemic, yet due to Koch's bacillus. Malaria is neither contagious nor epidemic, yet is caused by an intra-cellular parasite; again, tetanus is not contagious, and hardly more endemic than cancer itself, as shown by the researches of Haviland, and confirmed by recent investigations.[1] The second objection was that cancer could not be inoculated from one individual to another or to animals.

Cancer has been transferred from one part of the body to others in the same individual (Hahn and Von Bergmann) by inoculation, and moreover, it has been transferred from one animal to others in a few cases. That most of the experiments in inoculating animals have failed is really no objection to the theory. We know that there are many vegetable and animal parasites whose life history embraces a long cycle of changes in form and development, only a brief portion of which is found in the "host."

The *evolution* of *parasites* is a subject of great interest and importance, yet one that, as yet, has been but little investigated by the trained naturalist and biologist.

For a clearer understanding of the "laws of parasitism," and their relation to specific diseases, we are much indebted to the recent and valuable contribution of Dr. Joseph Frank Payne, of London. If his view, that there is a definite relation between the contagiosity of a specific disease and its chronicity be correct, we at once see a striking analogy between cancer on the one hand, leprosy and tuberculosis on the other, and there is no need to go further for an explanation of the slight contagiosity of cancer. Ballance and Shattuck go so far as to assert that "there is no fact in the etiology or life history of carcinoma or sarcoma that has not its counterpart in tuberculosis."

[1] The researches of Gueilliot prove cancer to be mildly contagious.

2. *Analogous diseases in animals and plants known to be of parasitic origin.* In the vegetable kingdom we find a large variety of "tumors" known as "galls." One by one these have all been proven to be of parasitic origin. If we turn to the lower animals, we find in "coccidial infection" an analogy so striking, that many observers have considered it identical with cancer. Without entering into any discussion of this question, this much may be regarded as proven: That certain low organisms or protozoa known as coccidia, have been found in animals, chiefly rabbits; that they possess the very *rare* property of being able to set up a proliferation of epithelium; that in the animals in question, and at least in one case (Leuckhart's) if not in two cases in man, they have produced multiple tumors associated with the same clinical symptoms and pathological changes that are found in true cancer.

We must further admit that several independent observers, notably Sawtschenko on the Continent, and Ruffer and Walker in England, by the use of improved methods of staining have been able to demonstrate the constant presence of protozoa in a very large number of specimens of carcinoma. That these are true parasites and not "invaginated cells" or "degenerated metamorphoses," as many have been inclined to regard them, has been very recently confirmed by the testimony of Metschnikoff, the highest living authority in micro-zoölogy.

These protozoa are so similar to the coccidia already referred to, that they can scarcely be differentiated. Whether or not they are identical, seems to me a matter of indifference; that they are very closely allied forms seems more than probable. That they have not yet been cultivated outside the body is no evidence against their being the cause of cancer, when we consider how much time it has taken to discover their mere presence.

If, with a distinguished authority, we admit that "for the development of cancer it is necessary that there should be a continuous irritation, and one capable of multiplication," and knowing as we do that the irritants capable of fulfilling these conditions are limited almost entirely to the animal and vegetable parasites, we can scarcely fail to accept the micro-parasitic theory. The great merit of this theory, as Ballance and Shattuck have pointed out, is that "it not only offers a working hypothesis for further investigation with which none other can compare, but it holds out the hope that it may one day admit of scientific treatment based on the same lines as other micro-parasitic diseases." Having endeavored to make clear the grounds for believing in the parasitic origin of cancer, the explanation of the action of erysipelas is not difficult. If a small quantity of blood-serum of an animal rendered immune to tetanus is capable of destroying or rendering inert the virulent bacilli in a fresh case, it is quite as easy to understand that the toxic products of the erysipelas streptococci might bring about such changes in the blood-

serum as to destroy the parasite of cancer. The parasite having been destroyed, the irritation would consequently cease, and this would lessen the hyperæmia of the parts, upon which factor the life of the tumor-cells of low vitality largely depends.

This theory, if it may be called such, has occurred to me as offering the best explanation of all the phenomena observed. It explains the rapid degeneration, with a breaking down of the tumor tissue, as well as the slower disappearance by absorption. It also explains those interesting cases, several in number, where an erysipelas remote from the tumor has caused a disappearance in precisely the same way as a local attack. These latter cases, it would seem, prove the phagocytosis theory insufficient to explain the action of erysipelas. It is worthy of note that the action of erysipelas upon lupus and the secondary and tertiary lesions of syphilis (see Mauriac) is similar to that in malignant tumors, and this fact, joined to the fact that erysipelas has never been known to affect non-malignant tumors, is another point in favor of the parasitic origin of cancer.

The attempt to explain its action on the theory of a mere local irritation, classing it with the various caustics, needs only to be mentioned to be disproved.

The clinical facts already mentioned, that a number of malignant tumors have disappeared as a result of an erysipelas in another region of the body, coupled with the very recent experiments of Prof. Spronck and his co-workers in Leyden, settle the point beyond dispute. In the experiments referred to, twenty-six cases of malignant disease (eight sarcoma, eighteen carcinoma) were injected subcutaneously with the toxic products of the streptococcus of erysipelas, the germ itself having been destroyed and removed.

In every case the injections were made in parts remote from the tumor, usually the gluteal region. Nearly all of the cases of sarcoma showed marked improvement, and in some cases the tumor entirely disappeared. It is true recurrence usually took place, yet in one case (Remsen's), a large inoperable sarcoma, the primary growth entirely disappeared, the secondary growths were reduced to very small size, and there had been no recurrence up to the publication of the paper.

The effect upon carcinoma was very slight, and only in one case was the beneficial action marked.

It should be noted that very small doses were used in these cases, one-half to one gramme.

In no case was the reaction very great, 103° being the highest temperature recorded, the condition usually becoming normal at the end of twenty-four hours. Spronck himself admits that better results might have been obtained from larger doses, yet he preferred to err on the side of safety.

Treatment by repeated injections of fluid cultures. As far as I know, my cases are the only ones that have been treated by repeated injections of the pure fluid cultures of erysipelas.

I began this method more than eighteen months ago, and have used it in nearly all my cases. I have in most cases made the injections deeply into the tumors themselves. The doses employed have varied with the age and virulence of the cultures, but I have aimed to obtain a good reaction, a temperature of 104° or 104½° frequently following. The reaction has usually subsided within thirty-six to forty-eight hours after the injection, unless erysipelas was produced. The effect upon the tumors was more marked in the cases of sarcoma than carcinoma, but all cases showed a cessation of growth and a more or less marked diminution in size. Several sarcomatous nodules, some nearly one inch in diameter, disappeared entirely. It is evident that in these cases the effects produced were chiefly due to the toxic products of the streptococci.

In view of these results, as well as those of Spronck, it may be considered definitely proven, that a portion, if not all, of the benign influence rests in the toxic products of the erysipelas germ, rather than in the germ itself. The fact that, thus far, the results from an attack of true erysipelas have been far more brilliant and permanent, prove that either the germ itself or its continued action plays an important rôle, or, what is quite as probable, we have not yet learned how best to isolate the toxic principles and to use them in the most efficacious doses. It is more than probable that sterilizing cultures by heat changes the chemical relations of the toxalbumins. I am at present, with the assistance of Dr. Alexander Lambert, making experiments with *filtered cultures*, the germs having been removed by means of a Kitasato filter, without subjecting the fluid filtrate to heat. If the virtue of the erysipelas lies entirely in these toxic principles, the treatment of malignant disease will be much simplified, as there will be neither the danger from the erysipelas nor the necessity for isolation.[1]

Dangers associated with erysipelas. I have endeavored to ascertain as far as possible the actual mortality of uncomplicated erysipelas. Nearly everything that has been written upon the subject is of little value in determining this point, because the term "erysipelas" has been used in a very loose way, including many cases of cellulitis and septic infection. I do not believe in the identity of the streptococcus of erysipelas and the streptococcus pyogenes, although I am aware that the opposite opinion is held by many of the leading bacteriologists. Those who hold to the identity of the two germs, base their opinion largely upon the close

[1] Since the above was written, the very valuable researches of Roger have been published in the Revue de Méd., December, 1892. They go far toward proving that the virtue of the erysipelas rests in the toxic products, which can be easily isolated and used in much larger doses than by Spronck.

resemblance, morphologically and biologically, and they claim that the clinical differences are due to the different sites of infection and variations in virulence of cultures; that the same germ in the outer layers of the skin will produce true erysipelas, that injected deeply into the tissues will cause cellulitis and multiple abscesses. I believe this explanation entirely theoretical and not supported by facts. During the course of these experiments I have injected, upward of one hundred and fifty times, pure cultures of the streptococcus of erysipelas, of almost every degree of virulence, into the (human) tissues, superficially and deeply. In but two cases did I see an abscess, and in one of them a careful bacteriological examination was made of the pus (before it had become contaminated), and mixed cultures were found, the staphylococcus aureus being present with the streptococcus.

There appears to be good ground for believing that when suppurative processes are associated with erysipelas, a mixed infection is present, and that there is a real and important difference between the germ of erysipelas and the streptococcus pyogenes, in spite of their close resemblace.

The fact that they are pathogenic for different animals respectively, and also their different action with reference to lactic acid, are other points against their identity.

If we include the cases of diphtheria inoculated with erysipelas (Babtschinski), we have a total of 40 cases where erysipelas has been artificially produced, with but one death—2½ per cent. We know that the virulence of the germ varies within wide limits, and that it can be modified at will by passing it through animals, therefore it seems reasonable to assume that with proper precautions its mortality in inoculation can be made trifling or *nil*.

Conclusions.—1. The curative effect of erysipelas upon malignant tumors is an established fact.

2. The action upon sarcoma is more powerful than upon carcinoma, in about the ratio of 3 to 1.

3. The treatment of inoperable malignant tumors by repeated inoculations of erysipelas is both practicable and not attended with great risk.

4. The curative action is systemic, and probably due chiefly to the toxic products of the streptococcus, which products may be isolated and used without producing erysipelas.

5. This method should *not be employed indiscriminately* until further experiments have proved its limitations.

In concluding, I wish to express my great indebtedness to Dr. Wm. T. Bull for the advice and assistance frequently and generously given, without which much of the work would have been impossible. I am also under deep obligations to the authorities of the New York Cancer Hospital, to Drs. Prudden and Cheesman of the College of

Physicians and Surgeons, and to Drs. Ferguson and Biggs of the New York Hospital Laboratory, for kind assistance and laboratory facilities.

[NOTE.—Since the above paper went to press I have continued my experiments, with the following results: I have had one fatal case of erysipelas inoculation—a large inoperable sarcoma of the neck. The patient was sixty-five years of age, and his general condition had been greatly impaired, both by the disease and by a very extensive operation a short time before. Attenuated cultures having failed to produce any reaction, a fresh culture from a virulent case was used. A severe attack of erysipelas followed, to which the patient succumbed on the fifth day. In this short period a marked change had taken place in the tumor. No breaking down had occurred, yet it was less than half its former size.

Toxic products. During the past month I have been using a preparation of the toxic principles of erysipelas in four cases of inoperable sarcoma. The injections have been made into the tumor itself, and repeated every forty-eight hours. The reaction has been almost identical in character with that produced by true erysipelas, though milder in degree, and it has always passed away within twenty-four to forty-eight hours.

The temperature has never risen above 103½°, and has usually dropped to normal the following day. I have frequently made use of the toxic products of the *bacillus prodigiosus* in combination with the products of the erysipelas coccus, to intensify the action of the latter, and always with the desired effect. (This peculiar action of the one germ upon the other, I may add, was noted by Roger in his recent experiments on rabbits.)

Every one of my four cases of sarcoma has shown a marked and progressive decrease in the size of the tumor, and in one case (*vide* paper, Case VI.) a sarcoma of the back and groin, the tumor has entirely disappeared, and the injections have been stopped. The patient has regained his normal weight (one hundred and sixty-five pounds) and has returned to work.

These results have been so encouraging that, for the present at least, I have decided to use the toxic products of erysipelas in preference to inoculating the germ itself. The advantages of so doing are very great. The necessity for isolation is avoided, and the action of the products can be so carefully regulated that the danger element can be entirely eliminated.]

Reference.	Surgeon.	Age	Date.	Character of tumor.	Erysipelas, accidental or inoculated.	Immediate results.	Final results.
1. Berlin. klin. Woch., 1866, 23; 1868, 32.	W. Busch	43 F.	1866	Multiple sarcoma of skin (face).	Erysipelas, facial, accidental.	Large tumor broke down; smaller ones disappeared by absorption.	Permanent cure.
2. Ibid.	Ibid.	28 F.	1868	Very large lymphosarcoma of neck, size child's head.	Erysipelas, facial, accidental.	Tumor diminished in size one-half in eight days.	Died on eleventh day, collapse.
3. Ibid.	Ibid.	19 F.	1868	Large inoperable sarcoma of neck.	Erysipelas, produced by putting patient in bed near case of erysipelas.	Tumor greatly diminished in size in two weeks; began to grow again.	Improvement temporary.
4. Archiv f. klin. Chir., Bd. xii. S. 18	Mosengeil	50 F.	.. ...	Carcinoma of face; partial excision; recurrence.	Erysipelas, accidental; slight attack lasting two days.	Cessation of growth; patient discharged at end of three weeks.	Not traced.
5. Inaugural Dissertation, Bonn, 1870.	Hahn	...	1870	Carcinoma of face.	Erysipelas, accidental, several attacks.	Temporary destruction of tumor.	Recurred soon after.
6. Archiv f. klin. Chir., Bd. xii. 111.	Mosengeil	...	.....	Epithelioma of ear.	Erysipelas, accidental.	Disappearance.	Cure.
7. Schmidt's Jahrbucher, Bd. cxlvi. 345	Lusana	52 F.	.....	Epithelioma of temporal region.	Erysipelas, facial, accidental.	Disappearance in five weeks.	?
8. Vratch, 1882, S. 262.	Stein	F.	.....	Large tumor of breast, skin adhesion, axillary glands involved; carcinoma with little doubt.	Erysipelas of back, accidental.	Almost entire disappearance of tumor, only two small nodules size of nut left.	Not traced.
9. Bull. de la Soc. de Chir., t. viii. 302.	Nélaton	...	.....	Large tumor of lower jaw (sarcoma probably).	Erysipelas, accidental, facial.	Entire disappearance.	Recurred.
10. Ibid.	Pamard	M. ad't	.....	Carcinoma of submaxillary glands following excision of tongue.	Erysipelas, accidental.	Completely disappeared	Recurred.
11. Ibid.	Delens	F. ad't	.....	Very large tumor of breast.	Erysipelas, accidental.	Total disappearance.	Recurred.
12. La Union Médicale, 1882, 136.	Dauchez	F. 52	.....	Carcinoma of temporal region ulcerating; enlarged glands.	Erysipelas, facial, accidental.	Tumor reduced in size one-half; glands entirely disappeared.	Recurred.
13. Gaz. hebd., 1885, 26.	Ricochon	F. 52	1885	Very large lymphosarcoma of neck; large tumor of tonsil.	Erysipelas, facial, accidental(sev're attack).	Very great decrease in size of tonsil and neck tumors.	Later grew again
14. Deut. med. Zeitung, 1886, 4.	Biedert	F. 11	1886	Large sarcoma; round celled sarcoma involving mouth, nose, and throat; tonsil tumor size of goose-egg	Erysipelas, facial, severe attack, accidental.	Entire disappearance of all tumors in one week.	Child perfectly well and free from recurrence one year later.
15. Beiträge z. klin. Chir., 1888, 445.	Bruns	47	.....	Melanotic sarcoma of breast.	Erysipelas, accidental.	Entire disappearance.	Permanent cure.
16. Centralbl. f. Chir., 1884, 44.	Neelsen	F. ad't	.....	Carcinoma of breast.	Erysipelas, accidental, severe; three weeks later 2d attack.	Tumor greatly diminished in size.	Recurred later; new tumor.
17. Ibid., 25.	Janike	F. ad't	.....	Carcinoma of breast, recurrent.	Erysipelas inoculation	Tumor much softer and smaller.	Death fourth day from erysipelas.

Reference.	Surgeon.	Age	Date.	Character of tumor.	Erysipelas, accidental or inoculated.	Immediate results.	Final results.
18. Erysipelas. Monograph, Fehleisen. Berlin, 1883.	Fehleisen	F. 58	1882	Multiple fibro-sarcoma of skin (gluteal region).	Erysipelas, inoculation (scarification).	Reaction in 61 hours; course 14 days; small tumors disappeared; main mass partially degenerated.	Temporary improvement.
19. Ibid.	Ibid.	F. 49	1882	Carcinoma of breast recurrent (2 x 3 inches diameter).	Erysipelas, inoculation.	Reaction 30 hours; two weeks' course; entire disappearance of tumor.	No relapse nearly one year.
20. Ibid.	Ibid.	F. 8	1882	Sarcoma intra-ocular; secondary in submaxillary glands.	Erysipelas, inoculation.	Reaction 23½ hours; little change in primary growth; glands diminished one-half.	Temporary improvement.
21. Ibid.	Ibid.	F. 52	1882	Carcinoma of breast, dissemnated.	Erysipelas, inoculation.	Reaction 19 hours; two weeks' course; tumor reduced one-half in two weeks.	No further decrease.
22. Ibid.	Ibid.	F. 40	1882	Carcinoma of breast, recurrent; axillary and cervical glands involved.	Erysipelas, inoculation.	Reaction 15 hours; one nodule softened and broke down, others not greatly diminished.	Temporary improvement.
23. Inaugural Dissertation, Berlin, 1889.	Weichel	M.	1889	Carcinoma of penis and ing. glands (recurrent).	Erysipelas, of scrotum, accidental.	Three weeks' course; entire disappearance of carcinomatous masses.	Patient died later from sudden hemorrhage from surgical wound. Autopsy: all organs normal.
24. Reports of N. Y. Surg. Soc., 1892; N. Y. Med. Journ., 1892, i. 641.	Gerster, A. G.	F. 16	1884	Sarcoma of femur; amputation of trochanter minor; recurrence in stump.	Erysipelas, accidental: five weeks after recurrence.	Entire disappearance of tumor.	Patient alive and well three yrs. after.
25. Annals of Surg., Sept. 1891, Coley	Bull, W. T.	M. 30	1884	Large round-celled sarcoma of neck; five operations; recurrence.	Erysipelas, accidental, two attacks.	Entire disappearance.	No recurrence in seven years.
26. Vratch, 1882, 16; Lond. Med. Record, 1884, 11.	Winslow	M. ad't	1882	Sarcoma of neck; clinical diagnosis	Erysipelas, accidental.	Total disappearance.	One year later a sarcoma of breast developed.
27. Münch. med. Woch., 1890, No. 7.	Kleeblatt	M. 54	1888	Sarcoma of neck following removal of sarcoma of tonsil.	Erysipelas, accidental; second attack three months later by inoculation.	Diminution in size from child's head to pigeon's egg in ten days.	Temporary improvement Recurred two months; erysipelas inoc. Complete disappearance. 2d recurrence one month.
28. Ibid.	Ibid.	M. 52	1888	Sarcoma of neck (microscopic).	Erysipelas, inoculation.	Entire disappearance.	No recurrence 1890 (2 years).
29. N. Y. Cancer Hospital Records, 1883.	Powers and Dowd	F. 52	1892	Sarcoma sup. maxilla.	Accidental.	Diminished one-half in two weeks.	Recurred.
30. Annales de l'Institut Pasteur, 1888, 223.	Holst	F. 40	1887	Carcinoma of breast, recurrent.	Erysipelas, inoculation.	Reaction 20 hours; nine days' course; recurred three times; marked decrease in size.	Relapsed four months later.
31. Archiv. of Clin. Surg., July, 1892.	Hutchinson, Jonathan	F. ad't	.....	Probable carcinoma of breast.	Erysipelas, accidental.	Entire disappearance.	No recurrence in five years.
32. Personal communication.	Finney, J. M. T. (Baltimore)	...	.....	Epithelioma of nose, size of silver quarter.	Erysipelas, accidental.	Entire disappearance.	No recurrence in two years.
33. Ibid.	Ibid.	...	.....	Double carcinoma of breast, recurrent; axillary glands involved.	Erysipelas, inoculation.	Diminution in size; general improvement; had two spontaneous attacks later.	Died five months later from metastasis.
34. Ibid.	Starr, C. L.	F. ad't	1892	Carcinoma of breast and axillary glands; several nodules in arm; breast incised.	Erysipelas produced by direct inoculation from fresh case.	Severe attack of erysipelas extending over breast and down arm; nodules in axilla and arm disappeared.	Temporary improvement. Nodules in arm and axilla entirely disappeared.

Reference.	Surgeon.	Age	Date.	Character of tumor.	Erysipelas accidental or inoculated.	Immediate results.	Final results.
35. Ibid.	Eliot, E., Jr.	F. ad't	1892	Carcinoma of breast, recurrent.	Erysipelas, accidental.	Marked decrease in size of tumor, and general improvement.	Subsequent increase; attempt to inoculate unsuccessful.
36. Ibid.	Morris, R.I.	F. 26	Dec. 1892	Carcinoma of breast, recurrent.	Erysipelas, accidental.	Ten days' course; marked decrease in size of tumor.	Again grew.
37. Münch. med. Woch., July, 1890.	Kleeblatt	F. 23	.....	Tumor the size of pigeon's egg under eyelid.	Erysipelas, accidental.	Entire disappearance.	Cure.
38. Ann. Surg. Sept. 1891 (Coley). Reported in part.	Coley, W.B.	M. 31	May, 1891 Oct 1891	Sarcoma of neck and tonsil, recurrent.	Repeated inoculation; first real attack of erysipelas Oct. 1891.	Diminution in size; subsequent increase; after attack in October almost entire disappearance of tumor of neck and decrease of tonsil tumor.	Patient in good health March, 1893; no return in neck; tonsil tumor smaller.
39. Ibid.	Ibid.	F. 16	May, 1891	Sarcoma of femur size child's head; periosteal round-celled.	No attack of erysipelas produced; repeated injection of pure culture	Slight decrease in size; marked local and constitutional reaction.	Died 3 months later from exhaustion.
40. Ibid.	Ibid.	F. 26	July, 1891	Sarcoma of vertebræ, spindle-celled; recurrent.	Repeated inoculation; no attack of erysipelas; cultures attenuated.	Slight softening of tumor; reaction 103½°.	Effect temporary, injections continued but short time.
41. Unpubl.	Ibid.	M. 44	Feb. 1892	Sarcoma of back (17 in. in diam.), spindle-celled.	Repeated inoculation failed to produce erysipelas.	No effect on tumor.	Injections discontinued, as cultures were too weak.
42. "	Ibid.	M. 76	June, 1891	Carcinoma of face.	Inoculation failed to produce erysipelas.	Reaction 102½°; no effect on tumor.	But three injections made; cultures poor.
43. "	Ibid.	M. 40	April, 1892	Sarcoma of back and groin, recurrent.	Inoculation, severe attack of erysipelas; 2d attack Nov. 1892; 3d attack Dec. 1892; 4th attack Dec. 1892.	Tumor of back 7 x 4 inches entirely disappeared in two weeks, tumor of groin as well.	Recurred July. Reinoculated Oct and Nov. Tumor again almost disappeared. Recurred in back. Mar. 1893, condition excellent. Entirely disappeared after toxic products injections
44. "	Ibid.	F. 40	June, 1892	Sarcoma of breast, recurrent; eight operations.	Inoculation erysipelas; first attack June, second July.	Tumor much diminished in size; general health improved; small tumor of vagina disappeared.	Subsequent relapse and growth; treated by repeated injections of pure cultures. Subsequent operation and injection; still under treatment.
45. "	Ibid.	F. 42	Aug. 1892	Carcinoma of breast, recurrent; four operations; size of goose-egg.	Repeated inoculations eight weeks no attack of erysipelas	Tumor diminished in size one-half; general health not affected; Reaction 101 to 104°.	Subsequent growth.
46. "	Ibid.	M. 54	Oct. 1892	Carcinoma of cervical glands; recurrent.	Repeated inoculation; no attack of erysipelas.	Tumor softened and broke down in part; reaction 100–103½°.	Subsequent operation.
47. "	Ibid.	M.	Oct. 1892	Carcinoma of inguinal glands; recurrent.	Repeated inoculation; no erysipelas produced.	Reaction 103½°; partial degeneration of tumor.	

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DIFFUSE TUBERCULAR HEPATITIS WITH TUBERCULAR PERICARDITIS.[1]

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and
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The following case is worthy of being placed on record, both on account of the rarity of the disease and the unusual character of the symptoms.

Ellen S., aged twenty-eight years; married; husband and one child dead of tuberculosis; four children living and healthy; family history unimportant. Since her husband's death, two years ago, she has been in domestic service. She enjoyed good health until early in December, 1891, when she began to feel epigastric distress after eating, and a short time later vomited almost as soon as food was taken. The vomited matter became increasingly bile-stained, whilst strength failed and thirst was prominent. About January 1, 1892, she noticed a jaundiced hue which soon became quite marked. The bowels had become loose in December,

[1] Read at the Meeting of the Canadian Medical Association, Ottawa, September, 1892.

and now a troublesome diarrhœa set in. She frequently had chilly sensations, but no rigors, and was confined to bed during most of January.

When admitted to Toronto General Hospital, on January 27, 1892, she was considerably emaciated, and her face had an anxious, pained expression. The conjunctivæ and body surface generally were deeply jaundiced and the skin moist. Her temperature was 99.5° F., pulse 108–120 beats to the minute. Distress was still felt in the epigastrium, and also in the right hypochondrium, but there had been no vomiting for two weeks. The bowels were constipated and stools clay-colored.

Inspection showed the abdomen to be decidedly full in its upper part, and the lower border of the liver was easily traced across a level three-quarters of an inch above the umbilicus; it was even and somewhat rounded, the surface of the organ being smooth and tender. In the left side the hepatic dulness was continuous with that of the spleen, the lower end of which extended one inch below the border of the ribs. There was considerable tenderness all over the liver and spleen, and continuous pain in these regions was complained of.

There were signs of pleural effusion in the right side, dulness extending as far forward as the mammary line, and as high as the fourth rib in that line and the fifth dorsal vertebra behind. Over this area respiratory sounds were audible, but weak, and occasional friction sounds were present with both inspiration and expiration.

The apex beat of the heart was displaced a little outward and was somewhat diffuse, a high-pitched systolic sound, probably pericardial, being heard over the fourth and fifth costal cartilages to the left of the sternum, almost disappearing with inspiration.

The urine, specific gravity 1015, contained much bile-pigment but no albumin. No signs of disease could be found in the lungs, nor in the abdomen or pelvis, except those already spoken of.

February 8. Signs of pleurisy in left side.

13*th*. Pericardial friction fremitus felt in the third intercostal space; auscultatory signs very distinct. A week later the whole pericardium became affected, with considerable effusion, precordial dulness extending to the third intercostal space.

20*th*. Some coarse liquid crepitation present in lower parts of both lungs; this was found to vary in abundance from day to day. There was slight cough with occasionally some thick, dark sputum, mostly blood. The sputum disappeared entirely after a few days, and the cough subsequently abated so much as to give scarcely any trouble. Jaundice had begun to lessen perceptibly.

March 1. The pericardial effusion had begun to absorb; the right pleura showed no change, but the effusion in the left had gradually increased. The abdomen was extremely tender and diarrhœa troublesome, the stools being liquid and offensive. Some effusion into the peritoneal cavity was noted. The urine was less pigmented than at first, and contained a small quantity of albumin. Microscopic examination discovered the presence of pus corpuscles and crystals of tyrosin. The crystals were small, abundant (four or five in a field) and always adherent to pus corpuscles. The size of liver and spleen remained unaltered.

7*th*. Diarrhœa had become profuse and bowel motions involuntary; patient appeared *in extremis*.

10*th*. The bowels now became constipated and patient began to improve.

20*th*. She was quite hopeful and taking nourishment fairly. She slept better, had less pain, and the temperature was less disturbed, and finally sat up for an hour or two daily. This improvement lasted for only a few days, and then she grew rapidly worse again, the temperature varying from 96.5° to 103° F. There were profuse perspirations, but no chills. Jaundice was now completely replaced by a dusky livid hue. Fine liquid crepitation was heard in the lungs, more abundant and generally distributed than before. No signs of pericarditis were present, and no change was noticed in the condition of the right pleural cavity; the effusion in the left was increasing however, as was that in the peritoneal cavity. The urine still contained tyrosin crystals, pus, and a small quantity of albumin.

The patient's condition continued much as above during April, her strength gradually failing, although she had sat at the window of the ward almost daily. The liver showed no change in its condition, but tyrosin crystals were not found in the urine after April 10th. Death took place April 28th.

Report of post-mortem examination—made at the Toronto General Hospital, April 29, 1892:

Inspection shows the body of a woman of apparently forty years of age; emaciation extreme; skin dark and somewhat yellowish in color, black hair on chin and abdomen; rigor mortis and post-mortem staining poor; bedsores over sacrum.

Section shows subcutaneous fat almost none; muscles thin and black; omental fat much wasted; three pints of bright yellow slightly fibrinous fluid in abdomen.

Pleuræ: Diffuse adhesions on both sides; loculi containing fluid formed by adhesions also on both sides; loculus on left side large, reaching from second rib to base and limited by nipple line in front; both pleuræ greatly thickened by layers of plastic lymph, only that immediately next the serous membrane being replaced by fibrous tissue; the adhesions appear old and are about one-half inch in thickness, but break down readily, being nearly pure fibrin. The pleuræ are found, when stripped, studded with miliary tubercles. The inflammatory process has spread from right side into the anterior mediastinum, and plastic material is thickly deposited on right half of inner surface of sternum.

Pericardium: Complete fibrinous adhesion exists between the parietal and visceral layers; thick, but readily broken down, except over the surface of the right ventricle, where, on a spot the size of a 25-cent piece, it is firm and fibrous. The lungs overlap the pericardial sac, almost hiding it, and are glued to it by fibrin.

Lungs: Milliary tubercles scattered through both, by far most densely in and just beneath the pleuræ; caseating glands at root of lungs; no consolidation; œdema and hypostasis.

Abdomen: Perihepatitis and perisplenitis of some standing, and with adhesions similar to those found between the pleuræ, fixing the liver and spleen to diaphragm, and spleen to liver.

Spleen: Weight twenty-three ounces; diffuse perisplenitis, adhesions; reaches forward and to right till its border is attached closely to the left lobe of the liver by plastic lymph; miliary tubercles scattered widely through the organ and plainly visible beneath the capsule; consistency, firm; pulp, increased.

Kidneys: Taken out with difficulty on account of density of the peri-

nephric areolar tissue; capsules peel fairly readily; scars as from old infarcts; tubercles in both cortex and medulla, but not in large numbers.

Ureters and bladder: Healthy.

Uterus and ovaries: Healthy.

Supra-renal capsules: Post-mortem softening.

Appendix vermiformis: Four and one-half inches; healthy.

Intestines: Large and small intestines empty, thin, pale; nothing specially noticeable excepting adhesions (old) between the colon, omentum, and gall-bladder.

Stomach: Shows catarrh.

Liver: Large, sixty-two ounces; smooth; cuts hard, as though cirrhosed; of "nutmeg" appearance; miliary tubercles beneath capsule and throughout liver substance; gall-bladder, ducts, and veins healthy.

Pancreas: Soft; post-mortem changes.

Head: Not opened.

Microscopic examination. Miliary tubercles are demonstrated in the lungs, pleuræ, pericardium, diaphragm, liver, spleen, and kidneys.

Liver: Sections of the liver show miliary tubercles, though not in large numbers, from one to three in a section being common. They are scattered widely through the substance of the liver, and tend to be intra- rather than interlobular. In addition to the tuberculosis there is a *diffuse* interstitial hepatitis, which is largely of the intercellular variety, and which is accompanied by little or no alteration of the capsule from within. The interlobular tissue is widely infiltrated with inflammatory cells, and the inflammatory process has spread into the lobules, causing an intralobular cell-infiltration, in many places quite dense, and a considerable new formation of connective tissue along the lines of the capillaries. This process has extended in many instances through quite a fourth of the distance between periphery and centre of lobule. The capillaries are in parts apparently occluded by the new tissue formation, and numerous leucocytes are to be seen in some, occasionally completely plugging them. The liver cells have undergone marked changes. Fatty infiltration is prominent in parts, whilst cell-atrophy is very conspicuous in the peripheral areas of lobules, where the pressure of the new tissue and cell infiltration is felt. Deposits of brownish-yellow pigment, apparently bile-pigment, are seen here and there in cells, but not in abundance. In very numerous spots a curious hyaline-looking necrosis of the liver cells has occurred. This is noticed both in single cells and in groups of cells, and presents an appearance as though the cell protoplasm had become coagulated and broken up into a large number of roundish particles, some larger than a red blood-corpuscle, but many much smaller. These particles stain strongly with eosin. In most instances the remains of at least one nucleus are distinctly visible amongst the necrosed protoplasm. The nucleus may remain intact, showing large nucleoli, or may be split up into fragments. These necrosed cells are in some cases infiltrated with leucocytes. The nuclei persisting in the broken-up cells are mostly very large, and stain darkly and sharply with hæmatoxylin, and the necrosed cells are also increased in size. Their limits are very definite. Scattered throughout the liver are enlarged cells with gigantic nuclei, corresponding closely to those of the necrosed cells; these are probably going through previous degenerative stages. In some parts numerous small branching bile-ducts are to be seen, such as are noticeable in so-called hypertrophic cirrhosis.

This woman presented a most rare and interesting pathological condition, the true nature of which could be only partly understood from the post-mortem examination. It was thought at first that we had to do with a case of pylephlebitis, with much more than the usual jaundice. There were serious difficulties to be explained, however, if this diagnosis were to be accepted—*e. g.*, the absence of a primary suppurating focus or ulceration in the pelvis, cæcal region, or elsewhere; the absence of chills; the signs of perihepatitis and perisplenitis, together with the affection, one after another, of the several serous cavities, and the long duration of the case. Pyæmia, probably more frequently than any other affection, gives rise to inflammation in such various parts, but its course is usually terminated much earlier. Bright's disease was excluded as a cause, by the condition of the urine, heart, and circulation. That there was sepsis in the case was quite evident from the temperature chart, the sweats, the dusky discoloration of the skin, the tumefied spleen, etc.; the source and nature of the poison were not so readily to be gotten at. When several parts are simultaneously the seat of inflammatory lesions, our minds naturally turn to tubercle as a possible cause; but it seemed just as difficult to explain many of the observed phenomena, especially those pointing to the liver, if this etiology were accepted, as with any other. Few pathologists refer at all to tubercle as a cause of diffuse hepatitis, and those who make reference to it say that it gives rise to no symptoms. Ziegler describes one form of tuberculous liver as exhibiting a general connective-tissue hyperplasia, the parenchyma being traversed by bands of fibrous tissue, in which are lodged gray or yellow tubercles (*Path. Anat.*, 1890, Band ii., p. 599). Saundby, in 1890, said that he had seen two cases of tubercular cirrhosis in which there was a tubercular network surrounding the lobules, and in the lobules a remarkable development of biliary canaliculi (*Brit. Med. Journ.*, 1890, vol. ii. p. 1459). Delafield and Prudden, speaking of tubercular hepatitis, say that it may be *associated* with cirrhosis (*Handbook of Path. Anat. and Hist.*, 1889). Coats, in his latest edition, makes no mention of the condition. Osler states that with eruption of miliary tubercles in the liver there may be a slight increase of connective tissue, which is, however, overshadowed by fatty change. "Practically," he says, "it is very rare, except in connection with chronic tuberculous peritonitis and perihepatitis, when the organ may be much deformed by a sclerosis involving the portal canals" (*Practice of Med.*). Pepper records a case following measles, in which jaundice was occasional; the liver was hobnailed. No history of syphilis could be obtained. Klein has described *acute* interstitial hepatitis as he found it in eight cases of scarlatina. R. P. Howard, of Montreal, in a paper on "Cirrhosis of Liver in Children," reports seven or eight out of sixty-three as being coexistent with tubercle.

Having been unable to find anything in the history of our case or in

the post-mortem appearances apart from the tuberculosis that would account for the occurrence of an interstitial hepatitis, we are constrained to believe that it resulted from irritation caused by the specific poison of the tubercle germs circulating in the blood. It could not have been the result of irritation by the localized tubercular nodules, since these were too few in number and too widely separated to account for a general hepatitis. The condition of the stomach and intestines was not such as to lead one to suppose that any fault in them was the cause. The points in the microscopic appearances which seem to add special strength to the view taken are: 1st, diffuseness of the process; 2d, large amount of cell infiltration present; 3d, necrotic condition of liver cells.

With regard to the first point nothing need be said, but of the second we may remark that such an inflammatory process is what one might expect where the poisoning was as acute as in this case. The comparatively small development of fibrous tissue is not what one would naturally look for were the process caused by prolonged absorption of irritative matters from the digestive tract or by retention of bile by obstruction. Alcoholism was excluded from the history of the case, and the liver had none of the characteristics of an atrophic cirrhosis; the deposit of bile-pigment was extremely small and confined to a few cells, none of the bile capillaries being plugged and dilated with it as so commonly seen in obstructive cirrhosis. A catarrh spreading from the duodenum might, of course, account for the passing jaundice, but not for the persisting hepatitis. The presence, moreover, of necrosed liver cells points rather to a toxine effect than otherwise. It has been shown that the toxalbumins of diphtheria and typhoid fever give rise to such a necrosis as described (*Johns Hopkins Hospital Bulletin*, March, 1892) and (Osler's *Practice of Med.*, art. "Typhoid Fever"). One of us has also observed a similar cell necrosis, with leucocytic infiltration, in a case of syphilitic cirrhosis.

The occurrence of tubercular pericarditis is worthy of note, since so few cases of this disease are on record. When she first came under observation there were signs of old pericarditis; these signs underwent no change and at the autopsy they were found to be due to old adhesions. Later, signs of fresh inflammation developed over the base of the heart and gradually extended downward to the apex. The moderate effusion that resulted was fairly rapidly absorbed and in five weeks after the first signs of pericardial disease showed themselves, all traces of the attack had disappeared. The history of the pericarditis contained nothing distinctive in itself; its tuberculous nature could be surmised only from the associated conditions.

A CLINICAL CONTRIBUTION TO THE SUBJECT OF SYMPHYSIOTOMY.

By Egbert H. Grandin, M.D.,
of New York.

Never in the history of obstetrics has the motto *Festina lente* been more appropriate to be inscribed on the crest of physician and obstetrician than at present. We are apparently on the verge of a "symphysiotomy wave," born of the enthusiasm awakened by the reports from Italy and France of the wonderful results yielded by this rejuvenated operation. Needless to recall the great abuse resulting from the "abdominal section wave" which reached these shores from Birmingham, England, about twelve years ago, in order to sound a note of warning lest the obstetrician be led astray even as many of us were as gynecologists. Symphysiotomy in this country must be judged by the fruits it yields here, and until the harvest of cases is ripe as regards ultimate results, it will be wise to temper enthusiasm and to weigh the operation after the most judicial fashion. Every physician, every obstetrician, hopes in the bright future of the operation; for, this assured, embryotomy ceases to be justifiable on the living, and excessive pressure on the fœtal brain by protracted forceps—moulding being avoided—the number of cranks, idiots, and epileptics in the world will decrease. We must not, however, allow these hopes to swerve us in the present toward an operation which, in this country, is only on trial. We must await the essential verdict of American obstetricians in regard to *the ultimate integrity of the symphysis.* Should it be proven in this country that close apposition, no interference with locomotion, no mobility at the symphysis is the rule, then, and only then, should the operation secure with us the standing it holds in Italy and in France.

At the present I would hold it may fairly be claimed that symphysiotomy should not have a mortality rate, where it is resorted to on a patient not exhausted by protracted labor, or by ineffectual attempts at delivery by other means and on a patient not septic. Other things equal, further, the child should be saved. Injury to the bladder and urethra is avoidable. Hemorrhage is only likely to occur where an improper incision is made, and if it do occur it may be controlled. Sepsis here, as elsewhere in surgery, means faulty technique.

My individual experience leads me to favor a primary incision extending upward from the pubic eminence. I regard the incision downward, to one or the other side of the clitoris, as faulty and unnecessary. I believe it to be better practice to avoid, where possible, the cutting of the insertion of the recti. The finger should be inserted between the recti, and, when hooked under the symphysis, should remain there in

order to guard against injury to the bladder and the urethra. The incision through the symphysis should be made from above downward, and from without inward. The subpubic ligament should be severed by cutting down on the finger and *not* by upward cutting by the Galbiati knife or its modifications. Whilst it is well to possess Harris's modification of this knife, in the average case a stout bistoury will suffice for the operation. The subpubic ligament *must be severed* in order to secure the separation at the symphysis which leads to increase in the pelvic diameters. When bringing the bones in apposition, after having effected delivery of the fœtus, especial care must be taken to depress thoroughly the urethra and the vesical neck, else, as happened to my first case, these portions of the urinary apparatus may be nipped and a vesico-abdominal fistula will result.

These, very briefly, are the general conclusions I am prepared at the present to advance, and they are based on the following clinical experience:

Case I.—Mary, aged nineteen years; nullipara; at term. When I was called to this patient the membranes had been ruptured for four hours; the first stage was completed; the vertex was presenting, well flexed in the left anterior position. Notwithstanding strong uterine contractions the fœtal head remained wedged at the brim. The fœtal heart was 160 and irregular, the maternal pulse varied from 120 to 128. The pelvic measurements were:

Spines	8¾ inches.
Crests	9¾ "
Antero-posterior, about	7 "
Conjugata vera (under chloroform)	3¼ "

The pubes were deep and the sacral promontory projected in a sharp spine.

Version being contra-indicated, I applied the forceps, but I was unable by judicious traction to bring down the head. I at once elected symphysiotomy, and made a primary incision extending upward three inches from the pubic eminence. I separated the recti with my finger and inserted this under the symphysis. With an ordinary bistoury I made the section of the symphysis from above downward and from without inward to the subpubic ligament. The fœtal head being wedged at the brim, interfered greatly with the severing of the inferior ligament of the pubes by the Galbiati knife. On completion of the operation the pubes separated to the extent of 1½ inches, this space being increased to the extent of 1 inch during difficult forceps extraction. Deep silkworm-gut and superficial catgut sutures were used to bring the tissues together. During the pubic section and in bringing the bones together the urethra was depressed carefully.

The diameters of the fœtal head were:

Bi-temporal	3 inches.
Bi-parietal	3½ "
Sub-occipito-bregmatic	3¾ "
Occipito-frontal	4⅝ "
Occipito-mental	5 "
Circumference	13¾ "
Weight of child (a female)	7.1 pounds.

The posterior fontanelle had closed, and the anterior was two-thirds below the usual size.

The operation was performed on February 11, 1893. At this writing, March 31, 1893, the child is alive and thriving, and the mother walks without difficulty. The convalescence of this patient was unusually stormy. Two days after delivery a deep and extensive sub-mammary abscess was opened. On the seventh day a mural abscess broke through the line of incision (the result of using catgut for superficial sutures?); on the tenth day a *vesico-abdominal fistula* appeared; and later a catarrhal laryngitis and a double crural phlebitis. The fistula closed spontaneously; the patient was first out of bed on the fifteenth day, and walked for the first time on the thirty-fifth day. There exists close union at the symphysis, and no mobility.

Remarks.—This woman could only have been delivered otherwise of a *living* child by the Cæsarean section, and symphysiotomy was elected in order to avoid stillbirth and embryotomy of the living child. The child *might* have been *dragged* through by forceps, but dead and at the expense of the maternal soft parts. Brute traction no longer, however, plays a part in scientific obstetrics.

The abdomino-vesical fistula was due to one of two causes: The fœtal head being wedged at the brim, the neck of the bladder may have been injured during the insertion of that clumsy instrument—the Galbiati knife; or, notwithstanding the care with which the urethra was depressed, the bladder was nipped by the pubic bones when they were brought in apposition. The accident, however it occurred, is preventable, and in nowise argues against the operation of symphysiotomy.

Case II.—Mary, aged twenty-three years; nullipara; 4 feet 6 inches in height; infantile pelvis, with the following measurements:

Spines	9½ inches.
Crests	9¾ "
Antero-posterior	6¾ "
Conjugata vera (under chloroform)	3+ "

The patient came under observation about seven weeks before term. After consultation with my colleague, Dr. R. A. Murray, three separate attempts were made to induce premature labor. On two occasions glycerin was injected into the uterus, the patient being in Sims's position and the pelvis elevated. The first attempt was absolutely futile; the second attempt was followed by strong uterine contractions and a profuse discharge of serum. I next endeavored to induce labor by packing the cervical canal and the upper vagina with gauze. This also failed in the desired result. On February 20, 1893, spontaneous labor set in. I saw the patient with my colleagues, Drs. Coe and Jarman, and after thorough examination under chloroform, the decision was reached that symphysiotomy best assured a living child. Accordingly, with the kind assistance of these gentlemen, I completed cervical dilatation by the hand, performed symphysiotomy, and delivered by podalic version.

The steps of the symphysiotomy were similar to those just described, with the exception that the more slender Galbiati-Harris knife was used to cut the subpubic ligament. The fœtal head being movable above the brim, this very essential part of the operation was not difficult. The pubic bones separated during extraction to the extent of 2 inches.

The measurements of the fœtal head were as follows (the child being premature by about four weeks):

Bi-temporal	$2\frac{5}{8}$ inches.
Bi-parietal	$3\frac{3}{8}$ "
Occipito-mental	$4\frac{7}{8}$ "
Occipito-frontal	$4\frac{1}{2}$ "
Sub-occipito-bregmatic	$3\frac{3}{8}$ "
Circumference	13 "
Male child, weighing	5.1 pounds.

The convalescence of the patient was uninterruptedly normal. She was out of bed on the twenty-first day, and walked for the first time on the twenty-fourth day. On March 23d, when examined in the erect position and whilst walking, there existed slight mobility at the symphysis, although there was close union. At this writing (March 31st), forty days after operation, the patient walks well; there is slight motion at the symphysis; the child is alive.

REMARKS.—This patient might have been delivered by forceps through protracted moulding of the fœtal head: very likely, however, with resulting stillbirth, or, at any rate, with grave lesion (due to pressure) of the fœtal brain. Herein, indeed, lies one of the great results to be predicated from symphysiotomy when it shall have been proven perfect in its ultimate results from the maternal standpoint. The wider my experience, the more the truth is forced upon me that many a deficient intellect might be traced to protracted labor and to the means resorted to for delivery—such as prolonged forceps traction from the pelvic brim or difficult extraction of the head after version.

In the year 1890 I performed the Cæsarean section twice under the relative indication. The measurements of the pelves and the diameters of the fœtal head were approximately like those in these two cases of symphysiotomy. (Vide *Transactions of the American Gynecological Society* for the year 1890.) Up to September, 1892, I was a determined advocate of the Cæsarean section whenever, other things equal, it was possible thus to avoid destruction of the living fœtus. The future of this operation was most brilliant, its results were constantly being bettered. Under the new order of things I am obliged for the present to look upon symphysiotomy as an operation bidding fair to displace the Cæsarean section under the relative indication. It is my hope that the record of the former operation in this country will justify the shelving of the latter, more formidable operation. Whilst I propose to advocate and to perform symphysiotomy, it will be with exceeding caution until it shall have been clearly proven that the operation entails no ultimate dis-

ability. Then, indeed, we will have witnessed the dawn of the day when embryotomy of the living finds no justification. Until then, however, I would emphasize my prelude: *Festina lente.*

PSEUDARTHROSIS (INCLUDING ALL VARIETIES OF DELAYED AND NON-UNION): WITH ILLUSTRATIVE CASES.

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I. *Simple Delayed Union.* (May be caused by shock, old age, rhachitis, gestation, lactation, scorbutus, syphilis, cancer, paralysis, local unrest.)

II. *Complete Separation; Detachment of Fragments; Non-union.* (May be due to above causes, faulty fixation, interposition of soft parts. The bone ends may be variously altered.)

III. *Fibrous Union.* (With or without much deformity.)

IV. *Osteophytic Pseudarthrosis.* (May be connected with tuberculosis, syphilis, cancer, hydatid cysts, etc.)

V. *Fibro-synovial—True New Joint.*

I. Simple Delayed Union.

When a bone which should have thoroughly consolidated after six or eight weeks has not become united after eight or ten weeks, we have a right to speak of it as a case of delayed union. It is not proper, however, to call it non-union, for union of the fracture may still occur. Delayed union is, therefore, a relative term, the time at which its use becomes proper being rather indefinite. The causes that may operate to lead to delayed union are numerous. Shock is not a common, but is still a recognized, cause. Old age is a common cause. Rhachitic children, or even elderly persons, are apt to have delayed union. The preparation of the fœtus, or of the milk for the newborn, may make such a demand for alkaline salts that gestation and lactation may divert the necessary materials from the seat of fracture to the uterus or the breasts, and may thus act as causes of delayed union. Scorbutic patients often have delayed union or none at all. Syphilis, especially the tertiary forms, may delay the repair of a fracture. Cancer sometimes produces a condition of the system in which there is fragility of bone, and, by another manifestation of the same tendency, there may be delayed union after fracture. If a patient breaks a paralyzed and atrophied limb there is often not enough nutritive activity to bring about speedy repair. Any diathesis may tend toward non-union. Local unrest, which includes the failure to provide a limb with proper support in the way of splints, may also act as a cause of delayed union.

II. Non-union.

The next degree of pseudarthrosis, in the general sense, is absolute non-union; that is, actual separation and detachment of the fragments without even a fibrous connection. This may be due to causes already specified for delayed union, or to faulty fixation, or to the interposition of soft parts between the bone ends. On reflection, it seems strange that soft parts do not always get in between the broken ends of bone, and it is not to be wondered at, therefore, that fibres of muscle or fascia or some other soft tissue intervene between the fragments and retard union or prevent it altogether. By faulty fixation is meant the improper "setting," as the laity term it, of a broken limb.

III. Fibrous Union.

This may occur with great or little deformity. At times this is the utmost that can be expected of certain special fractures, as of the olecranon, coracoid, acromion, patella, and neck of the femur. But the fibrous form of pseudarthrosis alluded to in this classification refers especially to those cases occurring in the shafts of long bones or at joint ends, and implies either faulty treatment or faulty action on the part of the tissues and failure on the part of the callus to ossify as it ought to do or to go beyond the formation of fibrous tissue.

IV. Osteophytic Pseudarthrosis.

In this variety osseous new-formations jut out in various directions from the fragments. Outgrowths occur in dendritic or arborescent forms or they assume various *bizarre* manifestations. It is found most commonly in connection with tuberculosis, syphilis, cancer, and sometimes with hydatid cysts located at the seat of excitement—that is, about the fracture.

V. Fibro-synovial.

This last variety is the one to which the term false joint or new joint is appropriately applied. The ends of the bones are rounded off and often become eburnated inside the new capsule which forms about them and which corresponds very closely to the synovial membrane of a joint. It is analogous to an adventitious bursa. As time goes on the capsule becomes stronger, the fluid which collects within it serves to lubricate the cavity, and there is produced literally almost a perfect new joint with a capsular ligament, but, of course, without true lateral ligaments. Its movements are quite free, and it is, therefore, called a "flail-joint." This kind of false joint is classically illustrated in the case of Living-

stone, the African explorer, who was bitten by a lion, and who, as the result of exposure, more or less exhaustion, and the lack of proper care to insure physiological rest, developed a pseudarthrosis of the humerus.

SURGICAL TREATMENT TO STIMULATE THE REPAIR OF NON-UNION.

I. *Stimulation without penetration to the bone.* This consists in an endeavor to irritate the ends of the bone—for example, by grasping the limb firmly and rubbing the bone ends together, or, it may be, by leaving off splints and allowing the inevitable irritation to act as a stimulus to the throwing-out and ossification of callus. In simple delayed union these means are often sufficient.

II. *Stimulation and irritation of the seat of fracture by something introduced from without.* The best-known method is by the introduction of a drill, in order to make a number of punctures, penetrating the bone at various points. This operation, devised by Brainerd, is a kind of insult to the bone-tissue, and is followed by a reaction with a little bleeding and cellular activity, which is often sufficient to make the bone unite. It has also been suggested to introduce from without, by means of a hypodermic needle or a long, fine hollow tube, some active chemical irritant, like acetic acid or tincture of iodine or alcohol, by means of which a very direct inflammatory action may be evoked. This is an endeavor to bring about the natural condition of exudation and then of ossification of the exudate, which is essential to the consolidation of a fracture. It is a method seldom resorted to at present, for it has been found that if the method by bone-drill is ineffective, this method will not do much; and it is not exactly scientific, for it sets up an inflammation which may possibly be followed by suppuration, as illustrated in a case hereafter reported.

III. *Exposure of the parts and mechanical fixation.* The third and most radical method consists in cutting down at the seat of fracture and fastening the bones together. For example: *a.* By a long drill, which is to be removed later. *b.* By drilling the bones and inserting a perfectly aseptic steel screw, ivory peg, or other similar fastener, the parts uniting and encapsulating it. Once in a while the foreign body used may invite exudation and softening, and may require removal later. *c.* Still another method consists in drilling and uniting the bone ends with silver wire, which is usually left in place, and which becomes encapsulated and does no harm. *d.* Again, some animal and therefore absorbable material may be used, such as silkworm-gut. It is immaterial just how this is inserted and just what material is used. It may be necessary in some cases to bevel the ends of the bones; in others it may be sufficient to saw them off squarely. Volkmann suggests rabbeting or mortising them together, but his method can seldom

be carried into practice with such accuracy as may be shown in diagrams found in literature on the subject.

CASE I. *Ununited fracture of the femur; attempt to wire the fragments found impracticable; amputation of thigh; death from shock.*—This patient was a criminal who, two or three months before operation, in the attempt to escape from jail, had fallen from a second-story window and sustained a fracture of the femur but a short distance below the lesser trochanter, along with other injuries which were of minor character. The upper fragment being so short, was pulled up by the psoas and so far displaced that all attempts to secure a good result with perpetuation of the proper axis of the limb were unavailing. Even extension in a nearly perpendicular direction failed. There was not only failure to get the fragments into line, but later complete failure to obtain union was apparent. Accordingly, on December 24, 1884, an attempt was made to suture the fragments together. The incision was made on the outside of the thigh, and it was then seen that the lower fragment lay beneath the upper, the overriding being to the extent of 4½ cm. There was no true callus, but the periosteum was loosened, and where callous should have been found there was a mass of friable granulations. By powerful traction upon the leg and by the use of the bone elevator, after freshening the bone surfaces, it was finally possible to engage the ends of the fragments in something like their proper position; but then, owing to the rigid fixation of the upper portion in its wrong position, mainly from contraction of the psoas, the proper line of union could be nowhere nearly obtained. Moreover, the periosteum was disintegrated and the bone texture materially altered, being extremely hard and very slightly vascular. Then two inches of the lower fragment was removed and the parts were drilled, and two efforts were made with strong silver wire to bring the ends into proper apposition. Each time the wire sutures broke, although the second time I used three strands of stout wire twisted together. As it thus appeared that it would be impossible to hold down the upper fragment into anything like proper position, and despairing of being able to accomplish the original object of the operation—further exploration, moreover, revealing several necrotic pieces of bone which had been separated from the shaft and were lying behind the field of operation—I allowed the patient to recover sufficiently from the anæsthetic to gain his consent to an amputation. He was then again anæsthetized, and amputation by lateral flaps was made, utilizing, as far as possible, the first incision. Several loose fragments of bone were found imbedded in the tissues behind the main fragments, one a piece 8 cm. long, the others quite small. As nearly as I could interpret the condition the upper fragment of the femur had been split by the lower, the posterior portion of the split fragment having been entirely loosened. The patient died on the evening of the same day, having never completely rallied from the shock of the prolonged operation.

CASE II. *Ununited fracture (pseudarthrosis) of the left radius; operation; recovery.*—Peter K., aged twenty-nine years, on July 21, 1884, fell from a wagon, breaking both bones of the left forearm near their middle. The ulna united, the radius failed to unite. January 13, 1885, the patient was operated on in my clinic, under the spray which was in use at that time. I cut down on the seat of fracture, and found a very perfect pseudarthrosis with eburnated bone ends and a complete capsule.

With gouge and knife I freshened the bone edges, which fortunately were oblique, and then drilled and wired them together with silver wire without the necessity of resecting the ulna or perceptibly shortening the radius. In this case, bony union was a little slow, but finally it became quite firm.

Case III. *Ununited fracture of the clavicle; operation; recovery.*— Robert McC., aged fifty-five years, late in November, 1885, fell and broke his left clavicle in its middle third. January 19, 1886, he entered the hospital with a well-nigh useless arm, with vicious position of the clavicular fragments, there being much shortening and the outer end of the inner fragment projecting two and one-half centimetres over the outer fragment and in front of it. The shoulder seemed to be stiffened, and motion in every direction was limited by one-half. Crepitus and mobility could be felt at the seat of fracture. January 30, 1886, the patient was operated on in my clinic, the ends of the bones were freed from their entanglement, which consisted for the most part of firm fibrous tissue, were then sawed obliquely and after being drilled were fastened with a double silver wire, whose ends were turned in between the fragments. There was considerable trouble with hemorrhage from the periosteal surfaces. In this case the skin wound united by primary intention, and the patient left the hospital in good condition. Some two years later he turned up in the clinic again with a recent fracture of the other clavicle, and at this time opportunity was offered for examination with regard to the final result of the operation. Motion of the shoulder was perfect and the arm was as useful as ever. The recent fracture healed kindly under a retentive dressing without the operation for which the patient had asked.

Case IV. *Ununited fracture of left femur; operation; recovery.*— Fred. K., aged twenty-five years, in January, 1883, became entangled in some revolving shafting and was thrown many times against some beams. Among other injuries he sustained a comminuted fracture of the left femur in its upper third, and another near the middle of the same bone. The right fibula and some ribs were also broken. He was attended by Dr. J. C. Green, who subsequently referred him to me. He recovered from all of these injuries save that the fracture in the middle of the left femur never united, and in consequence he had a flail joint, and the limb was shortened seven and one-half centimetres. He was wearing a cumbersome apparatus and was walking with the aid of two canes. After long deliberation he decided in favor of operation. November 4, 1886, nearly three years after the original injury, an operation was performed at his house; the incision was made on the outer and posterior aspect of the thigh; both bone ends were conically rounded off, and they overlapped about five centimetres; they were firmly united by a fibrous band. It required no small effort to loosen them, and then to remove about two centimetres from each fragment by means of the chain-saw; they were then drilled and a strong double silver wire was passed through the holes in such a way as to link the bone ends together. Bone drainage-tubes were used. On the completion of the operation the leg was nearly eight centimetres longer than it had been previously. It was dressed on an anterior suspension splint including the whole body, and recovery followed slowly, with a little suppuration of the wound. February 10, 1887, the patient was allowed to get

up and use crutches. Consolidation was slow in this case, but the ultimate result has been completely satisfactory.

CASE V. *Pseudarthrosis of both bones of right leg; operation; death from tetanus.*—Albert B., aged three years and two months, was brought to me from Allegany county; the patient seems to have suffered from rhachitic curvature of both legs during the latter months of infancy. According to his father's statement, a physician undertook to straighten the legs when the child was six months old. He etherized the child while no one was permitted in the room, and brought him out to the parents with the legs done up in splints. The present condition has existed ever since the splints were removed. January 11, 1887, I found an ununited fracture with pseudarthrosis of both bones of the right leg, of the tibia a little above the middle, and of the fibula at the middle. There was marked angular deformity and lameness. On the following day in the clinic both false joints were exposed by incision, the bone surfaces freshened, and the ends of the tibia were united by wire suture after drilling. No suture was used for the fibula. The conventional dressings were applied and the leg was dressed in a tin splint. January 17th the wound was re-dressed for the first time and found in good condition. The patient's pulse and temperature were a little high. By evening there was apparent a phlebitis of the veins of the thigh, which had developed very rapidly. On the following day his temperature had risen to nearly 107°, and he had had several typical tetanic convulsions. At five o'clock P.M his convulsions had assumed well-marked characteristics of tetanic opisthotonus, and he died the same night. This is the only patient I have ever had in whom tetanus has followed an operation of my own, and I am at a loss to account for it according to the views at present received with regard to its pathology, and prefer to leave the case unexplained rather than offer an unsatisfactory hypothesis.

CASE VI. *Compound multiple fracture of inferior maxilla; operation; recovery.*—J. J., aged twenty, of Warren, Pa., on June 30, 1880, was thrown out of a wagon on to a heap of stones, and besides sustaining numerous severe bruises broke his lower jaw in two places, nearly symmetrically, about 2 cm. on either side of the symphysis. The fracture on the left side was compound, both externally and internally. The patient was brought to me by Dr. Baker on July 5th for operation. The two fractures were exposed by an incision along the lower margin of the bone, and after drilling on each side of each fracture the middle fragment was held in proper apposition by a single twisted silver suture at each point. The ends of the wire were left projecting through the wound, both for drainage purposes and to facilitate their subsequent removal. Inside the mouth silver wire was also used about the teeth for additional protection. The silver sutures were subsequently removed, and the result in this case was all that could be desired.

CASE VII. *Fracture of olecranon; separation of fragments; secondary suture; recovery.*—Harry G., aged seventeen, on December 8, 1890, while away at school, fell upon the ice, striking the elbow and fracturing the olecranon. The arm was dressed in the straight position, but no satisfactory effort seems to have been made to hold the fragment in position. Two weeks later the arm was relaxed into a slightly flexed position and put in plaster-of-Paris. This was taken off on December 29th, and he was brought to me by the late Dr. Burwell. There was at this time a

separation of 2 cm., and the fragment was quite movable. Operation being suggested and accepted, it was performed at the patient's home on January 2, 1891. By this time the separation amounted to nearly 3 cm. A straight incision over the olecranon was made, the bone surfaces carefully evened and freshened, and, after drilling, two silkworm-gut sutures were introduced, by which a very accurate approximation was effected. The wound was closed without drainage, and the arm dressed in the straight position. Recovery was perfect and rapid, and the patient now has as useful an arm as ever.

CASE VIII. *Compound fracture of leg; resection of both bones and suture; recovery.*—Michael D., aged twenty-two, on October 2, 1891, fell from a bicycle and sustained a compound fracture of the right leg, the tibia being not only broken, but one fragment was entirely separated from its bony connection and was attached only by adhesions to the soft parts around. At that time he was anæsthetized and a silver wire was wrapped completely around the bone by the house surgeon, the wound being closed and an aseptic dressing applied. This wound healed almost completely, but there was absolute failure of the bone to unite. On October 31, 1891, there being still no attempt at union, I operated in clinic, and resected 5 cm. of the tibia and fibula, and fastened the ends of the fragments of the tibia together with silver wire, after drilling. On November 11th the first dressing was made. At this time there was no apparent attempt at union. The leg was re-dressed in a splint and consolidation took place slowly, but finally perfectly, and the patient was discharged some weeks later with a useful leg.

CASE IX. *Fracture of femur; non-union; operation; recovery.*—Stephen McG., aged thirty-nine, on November 3, 1891, was struck by an engine and sustained a fracture of the right femur near the knee, and of the left clavicle near its middle. The clavicle united without incident, save that a small loose fragment which presented beneath the skin was aseptically removed under cocaine anæsthesia. The leg was dressed with the long splint and traction. This dressing remained undisturbed for six weeks, but upon its removal it was apparent that absolutely no union nor even attempt at it had occurred. It was therefore left without splint, but with traction continued, hoping that by friction and excitation of movement, callus might be thrown out. In this, too, disappointment resulted. Finally, January 6, 1892, he was operated upon in clinic. With great difficulty and after a long incision, I dovetailed the bone ends together after Volkmann's method, and held them in place by a bone drill passed through the soft parts from above, and with a silkworm-gut suture wrapped around the bone ends and tied tightly. Drainage was made with a decalcified bone tube, and fixed dressings were applied. Three weeks later, upon the first dressing, considerable consolidation had occurred, and the patient was discharged after a month, able to go about on crutches. He has not since been heard from.

CASE X. *Ununited fracture of clavicle; operation; recovery.*—Celia H., aged five, of Hornellsville, N. Y., fell fifteen weeks before and broke her left clavicle. There was found considerable overlapping of fragments, with non-union. November 28, 1891, operation was performed in clinic. The bone ends were cut down upon, disengaged from their vicious fibrous union, the over-riding fragments freshened, drilled, and held together with a silkworm-gut suture. No drainage was used.

December 5th the first dressing was made, and primary union of the wound found, with already considerable consolidation of the fragments.

CASE XI. *Pseudarthrosis of radius and ulna; operation; probable recovery.*—John H., aged thirty-eight, of Allegany county, in November, 1888, had his left arm wound up in shafting, and both radius and ulna were broken about the junction of the middle and lower thirds. Previous to his coming to the Buffalo General Hospital three operations had been performed, the last by the exposure of the pseudarthrosis, but without the introduction of wire sutures. January 13, 1892, operation was performed in clinic. An incision was made upon each of the false joints, which were found to be perfect with eburnated bone ends and distinct fibrous capsules, inside of which several rice-grain bodies were found. This fibrous investment was dissected away and the four bone ends resected, not squarely but bevelled. They were then fastened together by silkworm-gut. At one point an old unabsorbed silkworm-gut suture was found, which had evidently been inserted by my predecessor. The wounds were closed without drainage, the arm placed on a straight splint. Previous to this operation there had been almost a right angle in the forearm. The patient remained in the hospital three weeks. Just before he left the old dressings were removed, and it was found that there was some motion still remaining. The forearm was therefore enclosed in a plaster-of-Paris dressing, and the patient was sent home. A month later he was examined; complete consolidation had not yet occurred. The plaster-of-Paris was renewed, the patient's urine was examined, and not being found alkaline nor requiring internal administration of acids, he was advised to take the compound syrup of the hypophosphites in maximum doses, and he has not since been seen.

CASE XII. *Compound fracture of tibia and fibula; non-union; operation; recovery.*—Nellie B., aged thirty-two, January 27, 1892, while under the influence of liquor, fell down stairs and sustained a compound fracture of the right leg. She was brought at once to my clinic, which was in progress at the time of her arrival. Being anæsthetized, I thoroughly cleansed the part, and, on examination, found that both bones of the right leg were broken at the junction of the lower and middle thirds. There was considerable bruising and bleeding from a small puncture rather to the inner side of the tibia. At this point I made a long incision, and found one piece of the tibia, 7 cm. long, entirely loose. The balance was broken in such a way that I was able to pass two silkworm-gut sutures and one double catgut suture around the obliquely broken fragments, and hold them in excellent apposition. The wound was carefully sprayed with hydrogen peroxide solution and dressed without drainage. Three weeks later, on re-dressing the limb for the first time, it was found that there had been practically complete failure to consolidate. The patient was again operated upon in clinic, and 5 cm. of each bone was resected, the tibia being again fastened together. From this operation she made a slow but perfect recovery.

CASE XIII. *Ununited fracture of femur; two operations; senility and necrosis preventing reunion.*—William W., aged sixty-five, a decrepit old man, on August 4, 1891, was run over by a wagon and sustained a compound fracture of the left femur, just above the condyles. His leg was dressed at home in a fracture-box, with traction. October 3d, when the dressings were removed, it was found that there had been no union. October 7th, on operation in clinic, a long incision was made across the

knee from the inner border of the tendo patellæ downward, upward, and outward, exposing this tendon, as well as the bone beneath. I found the bone ends irregularly shaped, without the slightest attempt at union. With forceps and sharp spoon I scraped and cut away the bone until I had the surfaces nearly even and fairly accurately apposed. An effort to fix them with a long drill was futile, so I held them as well as I could in an antiseptic dressing, with an absorbable tube drain, and bound firmly on a splint. Union of the wound was perfect. The dressing was left undisturbed for six weeks. On its removal it was found that not the slightest attempt at reunion was apparent. The limb was then left on a pillow and repeatedly moved every day, but still no result was obtained, and finally, at the patient's urgent request, I operated again on January 13, 1892, in clinic. This time a long external incision was made. I found that now a considerable portion of the lower end of the shaft of the femur above the original injury had become necrotic, although covered with a shell of new and living bone. All this I removed with the chisel, and finally resected about 5 cm. of the shaft with the chain saw. I also freshened, as well as I could, the upper end of the lower or condyloid fragment, but could devise no way to hold the fragments in apposition other than by binding them firmly upon a splint. The wound was closed with catgut drainage. This time, also, it healed perfectly *per primam*, but again there was absolute failure to throw out callus or form any union. The man stayed in the hospital several weeks longer, but I could suggest nothing further for him save amputation, which he declined. He was then removed to his home, no better off than before.

CRANIAL DEFORMITY AND OPTIC-NERVE ATROPHY.

By Harry Friedenwald, A.B., M.D.,
of Baltimore, Md.

There are three classes of congenitally abnormal crania: 1, The enlarged skulls of hydrocephalus; 2, the very small skulls or microcephali; and 3, the variously deformed skulls.

The last named, to which I wish to draw attention in this paper, are produced by the too early union or synostosis of the bones that make up the cranium, and the peculiar deformity depends upon which sutures are prematurely closed. If it be the frontal suture, then the deformity will consist in a very narrow forehead and very wide head behind, and is known as trigonocephalus. When the synostosis is along the sagittal suture it gives rise to the long scaphocephalus or boat-shaped head, with the depression across the middle.

The general rule is that if there is any interference with the early growth or extension of the cranial cavity in one part there will be compensatory development in other parts; the deficiency of one portion together with the excessive development of the others constitute the peculiar deformities under consideration. It would be impossible for

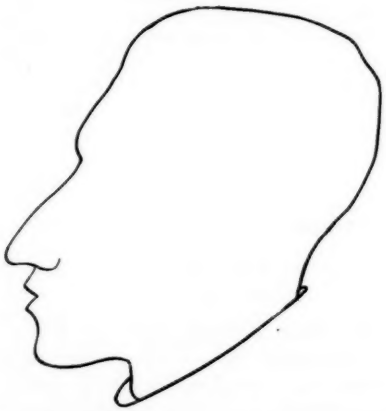
me to name all the deformities that have been described. I wish to mention but one in addition to those named above, the *Thurmschaedel* or steeple-shaped skull, known as oxycephalus, which is due to premature "synostosis of the parietal with the occipital and temporal bones, with compensatory development in the region of the bregma."

These many varieties of cranial deformity form a subject of great interest to the neurologist and alienist on account of their relation to epilepsy, idiocy, insanity, and crime. While it is of less importance, it is certainly not of less interest to the physician to study their relation to optic-nerve disease and to blindness.

To illustrate this I shall report the following case:

The patient is an intelligent salesman, aged twenty-six years. There was no blood relationship between his parents, who were both healthy, as are likewise his brothers and sisters. There is no mental trouble in the family. His head, deformed since birth, presents a typical example of

FIG. 1.

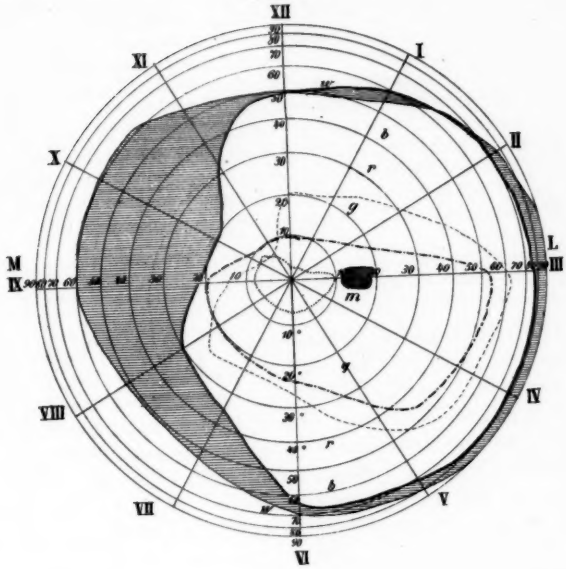


1. Circumference (50.5 cm., from which deduct 6 per cent. for skin and hair, making) 47.5 cm. (Average in men, 52 cm.)
2. Naso-occipital arc (34.5 minus 6 per cent. leaving) 32.4 cm. (Average 32 cm.)
3. Naso-bregmatic arc, 15 cm. (Average 12.5 cm.)
4. Bregmato-lambdoid arc, 11 cm. (Average 12.5 cm.)
5. Binauricular arc (35.5 cm., from which deduct 6 per cent.) 34.2 cm. (Average 32 cm.)
6. Antero-posterior diameter, 16.4 cm. (Average 17.7 cm.)
7. Greatest transverse diameter, 14.7 cm. (Average 14.6 cm.)
8. Binauricular diameter, 11.9 cm. (Average 12.4 cm.)
9. Distance of bregma from point in median plane midway between meatus, 13 cm. (Average 12.4 cm.)
10. Facial length, 13.3 cm. (Average 12.37 cm.)
11. Empirical greatest height, 14.5 cm. (Average in men, 13.3 cm.)

The peculiar deformity is prominently shown when measurements 1 and 11 are compared.

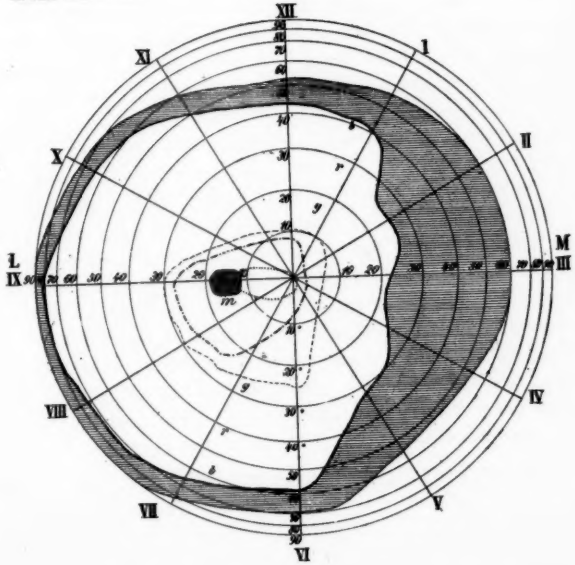
FIG. 2.

COD



White ———
Blue - - - - -
Red - - - - - -
Green ·····

COS



steeple-shaped skull, as is seen in the sketch of his profile and by the appended craniometrical figures.[1] At school he found that his sight was defective, the left eye being the worse. Since his school days his sight has not changed appreciably. He suffered from severe headaches until his sixteenth or seventeenth year, but since then they have been rare and mild. The eyeballs are bulged slightly forward.

The ophthalmoscopic examination made November 21, 1891, revealed atrophic papillæ which were grayish-white and not transparent, so that the lamina cribrosa was not visible; the papillary edges were slightly blurred and irregular. The arteries and veins presented no abnormality. (They were not tortuous.) It was evident that this is a case of post-neuritic atrophy.

The vision of the right eye is 8/XXIII, 8/XII partly, that of the left eye 8/XVIII. The vision cannot be improved by glasses. The fields of vision of both eyes are very much contracted on the nasal sides. (See Fig. 2.)

The history as well as the cranial and ophthalmoscopic appearances of hitherto recorded cases (see table) are in the main like the one just presented, as will be seen by referring to the list classified below, which are all that I can find reported since V. Graefe published the first in 1866. Of the seventeen cases (including the one above), *nine are properly classed among the steeple-shaped skulls* (Nos. 2, 7, 8, 9, 11, 12, 13, 14, 15, 17), and three are long heads (Nos. 1, 3, 10). In almost all there was post-neuritic atrophy of the optic nerve, or the papillitis itself was still visible. The visual power varies from almost full vision to total amaurosis; the field of vision wherever mentioned is found to be much contracted. The blindness came on unnoticed in early childhood in most cases, or was perhaps congenital (?). In case No. 3 of the table, the child when examined first was five years old and the neuritis was still active. I think it is very probable that in most cases it dates from the first few years of life. In none did it come on late in life. The intelligence of most of the patients is noted as being normal, though two suffered with epileptic convulsions. It is curious that fifteen of the seventeen cases are males.

Three cases of post-mortem examination are on record (Nos. 2, 15, 16), and in these narrowing of the optic foramen, with general hyperostosis or thickening of the bones, is noted. Still, most agree with Michel, who published one of these three cases, that as constriction of the optic foramen is rare, the immediate cause of the optic-nerve affection in most cases is to be sought in meningeal changes and in hydrocephalic conditions of the brain. At the same time stenosis of the optic foramen must be looked upon as a very important factor.

Virchow, who examined a number of Hirschberg's cases, believes that the cranial deformity and also the blindness are often to be referred to the same cause, namely, an inflammatory affection of the dura mater and the bone. Hirschberg concurs in this view.

[1] The cranial measurements were made according to Peterson, *New York Medical Record.*

Tabulated Cases of Cranial Deformity and Optic-Nerve Atrophy.

Reported by	Sex.	Age.	Deformity.	Vision.	Ophthalmoscopic appearance.	Autopsy.	Remarks.
1. v. Graefe, Arch. f. Oph., Bd. xii. No. 2, p. 133.	M.	8	Long, narrow skull.	Complete blindness, which came on suddenly.	Papillo-retinitis.	.....	Pupils widely dilated; patient cured; mother epileptic, father drunkard and suicide; other children died young.
2. Michel, Archiv. d. Heilk., xiv. p. 39; also, Handb. d. Kinderkr.	M.	15	Steeple-shaped skull.	.....	Neuritis followed by atrophy	Hyperostosis of skull; foramina optica narrow; pachymeningeal thickening over cortex.	Probably hereditary syphilis.
3. Hirschberg, Centralbl. f. Augenheilk, Jan., 1883.	M.	5–14	Scaphocephalus (Virchow).	R. $= \frac{15}{cc}$ L. = 0 Field of vision concentrically narrowed to about 20° all around; blindness came on gradually and unnoticed. L. divergent.	When first examined, optic neuritis, later atrophy.	.....	Had convulsions; eyes prominent.
4. Hirschberg, loc. cit.	F.	3	Great bulging of temporal region especially on the right side (Virchow).	Slight visual power; reduced gradually.	Neuritic atrophy.		
5. Hirschberg, loc. cit.	M.	15	Synostosis of sagittal suture with very broad fore head (Virchow).	Vision defective since early youth. R. $= \frac{15}{cc}$ L. almost blind and divergent. Right field reduced about 10 or 20°.	Neuritic atrophy.	.....	Had convulsions; intelligence fair.
6. Hirschberg, loc. cit.	M.	4½	Leptocephalus (Virchow).	Gradual blindness during first year; after that time complete.	Neuritic atrophy.	.....	Peculiar cranial deformity noticed when born.
7. Hirschberg, loc. cit.	M.	20	Skull narrow and high.	R. $= \frac{15}{xx}$; field of vision normal. L. counts fingers at 5′ (excentric). L. divergent.	Neuritic atrophy.	.....	Deformity noticed when born; intelligence good.
8. Hirschberg, loc. cit.	M.	7	Steeple-shaped skull.	R. $= \frac{15}{xx}$; field of vision fair. L. = 0.	Papillæ atrophic (light greenish-white color.		

Reported by	Sex.	Age.	Deformity.	Vision.	Ophthalmoscopic appearance.	Autopsy.	Remarks.
9. Hirschberg, loc. cit.	M.	9½	Steeple-shaped skull.	R. = $\frac{15}{xx}$; field of vision very narrow, about 20° in every direction. L. = 0 divergent.	Atrophy.	.....	Maternal grandfather had same cranial deformity; intelligence good.
10. Vossius, Klin. Monat. Zehender, 1884, p. 172.	M.	7½	Long skull, temples very wide, glabella broad, forehead low, and rises very slantingly.	R.=0. L. counts fingers at 8'. Divergence.	Atrophy, blurred papillary edges (probably neuritic, H.F.)	.....	Intelligence normal.
11. Stood, Zehender's klin. Monat., 1884, p. 241.	M.	33	Occipital portion undeveloped; steeple-shaped? (H. F.)	Blind since childhood. R.= $\frac{1}{o}$ L.= $\frac{1}{oo}$ Divergence; nystagmus.	.....	.....	Frequent convulsions (epileptic?) intelligence normal.
12 Mauz, Bericht der Oph. Gesells, Heidelberg, 1887.	M.	50–60	Steeple-shaped skull.	Had some vision as child, but gradually lost it almost entirely.	Post-neuritic atrophy.		
13 Manz, loc. cit.	M.	40	Steeple-shaped skull.	Had slight amount of vision, but lost it almost entirely after variola. R.=0. L. counts fingers.	Post-neuritic atrophy.		
14. Manz, loc. cit.	M.	young man	Steeple-shaped skull.	Blind since early childhood; slight perception of light in left eye	Post-neuritic atrophy.		
15. Manz, loc. cit.	M.	40	Asymmetrical steeple-shaped skull.	R. =0. L. about one-half examined, due to papillitis. Vision became normal, leaving a permanent defect in the field of vision.	R. old atrophy. L. fresh papillitis (due to intra-cranial tumor).	Cause of death: osteosarcoma on inner surface of right parietal and temporal bones. Base of skull very irregular. Foramina large and edges sharp, but optic foramina narrow.	Died at age of 40. The deformity of the skull was old, the tumor recent.
16. Ponfik, original not accessible, quoted by Manz.	...	...	Deformed skull.	.....	.....	Stenosis of optic foramina.	Details not accessible.
17. H. Friedenwald.	M.	28	Steeple-shaped	R. = $\frac{8}{xviii}$ L. = $\frac{8}{xviii}$	Post-neuritic atrophy.	.....	Intelligence very good.

I should ascribe case No. 1, in which total blindness came on very rapidly and soon disappeared, to hydrocephalus.

The question, I think, admits of still another explanation, or at least of another factor in the causation of the optic neuritis. The cranial deformity is due, as was pointed out above, to an enlargement of one part of the skull to compensate for the restricted development of another. Is it not probable that this compensatory enlargement offers more resistance to brain growth than does the normal enlargement, and that, during the early years of life, when brain growth is most active, there are periods when this resistance means such increase in intra-cranial pressure as would be produced by the growth of intra-cranial tumors? In other words, is it not possible that in many cases the optic-nerve affection is due to temporary increase in intra-cranial pressure? Certain it is that the optic-nerve affection, the optic neuritis which is produced, is such as would be present if this were the cause.

I make this suggestion not simply for its theoretical interest, but because it may give us the solution of the treatment of this otherwise incurable affection. The last few years have shown that brain and skull surgery has great possibilities. In epilepsy and idiocy from impeded cranial growth we have reason to hope for many cures, if the cranial vault is trephined and weakened, and thus allowed to expand. I believe that optic neuritis in children when due to cranial deformity should be put down similarly as a possible indication for trephining. Case No. 3 in the table might thus come under this head. If in such a patient we would be able to find any other signs of increased intra cranial pressure, I do not think that the operation would be out of place.

In microcephaly blindness is rare, as we would expect *à priori*, at least if we accept the view of Broca, that commonly this condition is primarily due to impaired development of the brain, and not to interference offered to its growth by the cranial bones. Still there may be cases where this last explanation holds, and in some of these we may expect optic neuritis.

The consideration of the relation of hydrocephalus to blindness is beyond the province of this paper.

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NEUROSES AND ARTHROPATHIES: ARE THEY RELATED?

By Edward Blake, M.D.,
of London, England.

In the May number of The Journal, 1892, the following query was raised by two distinguished members of the Harvard staff:

Is there any connection between chorea and rheumatism?

After an erudite statement of arguments for and against, and the quotation of many weighty authorities, the question may be said to have remained very much where it originally stood.

It will, perhaps, conduce to the clearness of our conceptions if we first try to establish the signification of that rather vague term "rheumatism" on some definite foundation.

I will, therefore, begin by defining what I mean by "rheumatism."

By acute rheumatism I mean multiple or diffuse myo-synovitis, whether septic or traumatic in origin, and whether it be complicated or not with cardiac disturbance.

By chronic articular rheumatism, I understand a neurotic dystrophy of tissue, usually preceded by tachycardia and other nerve changes; accompanied by peculiar modifications of the mucosa, the skin, including the hair and the nails, and succeeded by chondro-synovitis.

As there is no histologic difference between the chondritis of gout and the chondritis of rheumatism, we may, for our present purpose, view them as identical, at least during their acute stadia.

The positions that I seek to establish are as follows:

1. That there is a relation between chorea and chondritis.
2. That the nexus which unites them is a common causation.
3. That the relationship is not confined to chorea and chondritis, but that it exists with regard to the neuro-psychoses and all the arthropathies generally.

To establish this etiologic community, we must not only pass in review the ordinary causes of chorea, and see if they have the common property of inducing chondritis, but we ought also to scrutinize critically the supposed causes of rheumatism, and ask ourselves if they possess the undeniable power of causing chorea.

Here we come face to face with a very curious rule about which I have collected many thousands of highly interesting facts. A few of them have already appeared in The Journal in February, 1892; others were published in Philadelphia[1] last September.

It is, that the causes of chorea in woman are prone to induce rheuma-

[1] Septic Intoxication. F. A. Davis & Co.

tism in man. This, of course, holds good during adult life; in childhood there are many exceptions. For example, there is no evidence that intestinal parasites, which so frequently bring about St. Vitus's dance, will cause rheumatism.

But when we turn to the distressing emotions of the mind, the matter assumes a different aspect.

A. *Mental disturbance.* High on the list of the common causes of chorea stands *fright.* And anger will certainly accentuate chondritis in the gouty.

B. *Physical shock* will determine an acute accession of multiple synovitis of podagra or a persisting chorea.

C. *Alcoholic excess* predisposes to both these conditions.

D. *Uric acid* leads to neuro-psychoses in women, to chondro-synovitis in men.

E. *Septic matter,* as from gonorrhœa, marsh miasm, dyspepsia, and the so-called "zymotics," is prone to cause neuroses in women and various forms of arthritis in men.

F. *Lead* is one of the most remarkable examples of the elective affinity of a given poison for the locomotor apparatus in man and for the nervous system in woman. It would be foreign to our purpose to enter here into minute details; besides, the matter has been fully worked out elsewhere.[1]

It will suffice to remind the reader that a woman who is poisoned with lead develops that particular neurosis to which she may be prone, whilst men manifest chondritis or else a myopathy.

G. *Arsenic.* The tremors and twitching of arsenic are well known to simulate chorea; not so generally recognized is the fact, recorded in THE JOURNAL in the February number of 1892, that this drug has caused well-marked rheumatic gout.

H. *Mercury.* Mirror-makers suffer from mercurial tremor. Choreic movements of the extremities have been described as a result of mercury by various observers, as Rummel, Taylor, Pemerl, Kussmaul, Leroy, Schmitz, and Pleischl. Rheumatic results of salivation have been recorded by Kussmaul, Keller, Colson, and Vallon.

Enough has been said, I think, to show that the causes of chorea are the causes of chondritis.

The converse should, of course, hold good, viz., that the obvious causes of rheumatism are causes of chorea. But this is not so easy to prove. Innutrition, exposure, traumatism, do not seem, at first glance, to be the great etiologic factors in chorea; nevertheless the possibility that they may stand in such a relation assumes larger dimensions when we reflect that probably all act by arresting metabolism, and that they thus lead

[1] Sepsis and Saturnism. F. A. Davis & Co.

to a loading of the nerve centres with ptomaïnes. Add to these autotoxic states the heterotoxic influence of certain well-known poisons, as lead, arsenic, mercury, carbon disulphide, alcohol, and the gonorrhœal virus, and we have a fairly complete group of agents capable of inducing chorea as well as rheumatism.

It appears as if we doctors are so much occupied with establishing artificial and arbitrary, though useful, differentiæ that we seem to lose the power of recognizing alliances between the varied morbid manifestations presented to our gaze.

A CASE OF CEREBRAL ABSCESS FOLLOWING THE OPERATION OF TREPHINING FOR COMPOUND DEPRESSED FRACTURE OF THE SKULL; DRAINAGE OF ABSCESS; RECOVERY.

By George Heaton, M.A. M.B. Oxon., F.R.C.S.,
ASSISTANT SURGEON TO THE GENERAL HOSPITAL, AND VISITING SURGEON TO THE CHILDREN'S HOSPITAL, BIRMINGHAM.

H. C., a boy, aged twelve, was admitted into the General Hospital on September 16th last, with a history of having been hit with a "buckle belt" on the forehead.

The boy was conscious, but dazed; a small contused wound in the left temple led down to a depressed fracture in the frontal bone. The depression was about as large as a shilling, and the fragments were deeply driven in. The wound was enlarged by a conical incision, and a small trephine was applied above the depressed bone. The portions of bone which were depressed were then elevated and removed. The dura mater was bruised and blackened where pressed upon, but intact. The wound was thoroughly irrigated with weak perchloride, and the pieces of bone broken up into small fragments and replaced. The periosteum was then stretched over all, and the wound closed.

The patient progressed favorably for four days, except that his temperature rose in the evening of the second day to 101.4°. On the fourth day he suddenly became unconscious and had two convulsions. The fits started on the right side of the face, and then spread to the right arm and right leg, and lastly to the left arm. The dressings were removed and the flaps opened; some pus was evacuated. The coma passed off in five hours. During the next ten days he improved rapidly and the wound seemed to be granulating up healthily.

On October 1st, ten days after the fits, he became gradually drowsy, and almost continuously; and his pulse, which had ranged from 90–95, fell to 62–65, and became remarkably irregular.

On the evening of that day the wound was thoroughly reopened, and all the replaced bone, which was now intimately adherent, removed. The dura mater still remained intact, but was covered with sloughy granulations, and pulseless. An opening was made in it, and the frontal lobe of the brain explored with a scalpel, giving vent to six drachms of pus. The abscess cavity was washed out and drained.

During the next fortnight the patient seemed perfectly well, but the cavity in the brain refused to close.

On October 20th he began to vomit, to be restless, delirious at night, and to refuse all food.

Early on the morning of the 22d he was seized with very severe pain in the head, and became violently delirious. With the ophthalmoscope some early optic neuritis of the left disk was visible. He was anæsthetized for the third time; some bone was removed. The dura mater was freely slit up and the brain explored in several directions. Only a little cheesy-looking, granular débris escaped.

On regaining consciousness all his bad symptoms had disappeared.

He rapidly convalesced and was discharged well on November 25th. He was then a bright, intelligent boy, and the only evidence of any brain mischief was a slight paresis of the muscles of the right side of the face.

The clinical history of the above patient presents one or two points of sufficient interest to make it worth recording.

The cerebral abscess which formed in the left frontal lobe was doubtless a direct consequence of the complete closure of a septic wound. Fortunately for the patient, instead of a general septic meningitis being set up, a localized septic phlebitis followed, which, spreading inward to the vessels of the cerebral cortex, gave rise to a localized cerebral abscess. The formation of this abscess commenced presumably with the convulsions and coma on the fourth day after the operation, but it was not until ten days more had elapsed that the drowsiness, vomiting, and coma (pointing to compression by pus) commenced.

The abscess must have been in process of formation during this period, without causing any symptoms, for the boy appeared to be in perfect health. The exact nature of the disturbance three weeks later is not evident. The boy appeared to be rapidly dying of diffuse meningitis, yet an exploration, in which nothing definite was discovered, caused the immediate disappearance of all the grave symptoms.

THE CURE OF COMPLETE PROLAPSE OF THE RECTUM BY POSTERIOR PROCTECTOMY.[1]

By John B. Roberts, M.D.,
PHILADELPHIA, PA.

The means ordinarily advocated for the treatment of complete prolapse of the rectum seem to me either inefficient or too radical and dangerous. Searing the mucous membrane of the extruded intestine with nitric acid belongs to the first category; amputation of the prolapsed bowel to the second. It is possible that cauterization may be of service

[1] Read before the Philadelphia Academy of Surgery, November 7, 1892.

in mild cases of the affection; but it cannot be of much value when three or four inches of the everted bowel protrude through a widely dilated anus. The operation which I have designated posterior proctectomy is very efficient in such cases, and is, at the same time, more logical and probably very much less dangerous than amputation of the rectum.

In the *Annals of Surgery* for April, 1890, I described what I believed to be a new method of operating for rectal prolapse, and reported a case so treated. Further observation of the patient has convinced me that my confidence in the value of the procedure was well founded. This opinion has been substantiated by the reports of two cases in the hands of other surgeons who operated by my method. A short account of these three cases will perhaps show that evidence is not wanting to warrant my confidence in the utility of the operation.

CASE I. *Dr. Roberts's case. Prolapse of the rectum of fourteen years' duration cured by posterior proctectomy.*—A woman, aged thirty-four years, a weaver, had from the age of twenty suffered with prolapse of the rectum. The protrusion had originally occurred suddenly while she was at work and during menstruation. Her recollection is that the extruded portion was about three inches long; that she had looseness of the bowels, and was confined to bed about a week. Since that time the condition had continued. She always replaced the bowel after defecation, and had control of the contents of the rectum except when diarrhœa existed. About three years before she came under my observation she had been treated for what was considered to be membranous enteritis associated with the prolapsed rectum.

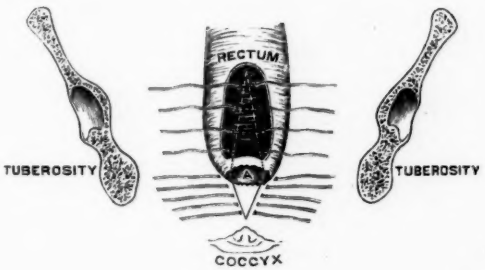
During the many years that this woman had endured the annoyances of her disease she had been treated by various local and internal remedies. The prolapse had, however, continued to increase and the anal aperture to become more and more dilated, until, when I saw her, a sausage-shaped mass about four inches long protruded through an anus into which I could readily insert the ends of my five fingers. The bowel was easily reduced, but soon slipped down between the buttocks, so that it was practically always prolapsed. The woman was dejected, nervous, emaciated and unable to work.

My dissatisfaction with the operations ordinarily recommended and a study of the mechanical problems presented led me to the conclusion that to narrow the calibre of the lower part of the rectum and at the same time diminish the size of the anal opening were the indications. This, I thought, would give the weakened and dilated sphincter muscle an opportunity to prevent the exit of the lower part of the bowel. At the same time there would be less tendency to invagination of the rectal wall, because the lower portion of the gut would be narrower than that part which the downward thrust of the pelvic contents tended to extrude. Cicatricial influences, moreover, would make the coats of the bowel more rigid and less easily inverted and doubled upon themselves.

The operation which I devised to meet these ends was carried out, and proved eminently satisfactory.

The patient was put in the lithotomy position, and the protruded rec-

tum fully reduced. I then made a small incision in the median line of the perineum, near the point of the coccyx; into this I inserted my finger and broke up the cellular connections posterior to the rectum, in a manner similar to that adopted in excision of the lower end of the rectum for carcinoma. A knife was then introduced into the dilated anus at a point half an inch to the right of the median line, and a deep incision carried obliquely backward, so that it divided the anal sphincter and skin from the aperture of the bowel to the original incision made at the end of the coccyx. The knife was then introduced into the anus upon the left side of the median line, and a similar incision carried back to the original wound in the perineum. These oblique incisions included between them a triangular portion of tissue consisting of skin, subcutaneous cellular tissue and an inch of the sphincter muscle. The base of the triangle was at the margin of the anus; its apex was at the extremity of the coccyx. About one inch of the sphincter muscle was thus excised by the two incisions. With scissors, I then cut out of the posterior wall of the rectum a long triangular piece embracing the entire thickness of the wall, which, in the first step of the operation, had been separated from its pelvic connections. The apex of this V-shaped section of the wall of the rectum was situated about three inches up the gut, while its base corresponded with the inch of the sphincter muscle of the anus, which had been included between the incisions previously described.



After hemorrhage had been controlled by catgut ligatures, chromicized catgut sutures were used to bring the divided wall of the rectum together. The first suture was introduced at the apex of the rectal wound; that is, three inches above the anus, and was tied with the knot within the bowel. Successive sutures were similarly inserted and tied at intervals of about one-third of an inch. The last intra-rectal suture was placed just inside the margin of the anus. The sutures were all tied with the knots upon the mucous surface of the bowel. It is possible that it would have been better to have used silk for these sutures, as they would probably have held the parts in apposition longer than catgut, even though it had been chromicized. As an aseptic condition of the wound in this situation is almost unattainable, I am inclined to think that hereafter I shall use silk instead of gut. This portion of the operation greatly reduced the lumen of the rectum, and was intended to make the lower part of the intestine funnel-shaped, with the small end of the funnel toward the anus.

The ends of the divided anal sphincter, which were left by the excision of one inch of that muscle, were then brought together by two catgut sutures and one wire suture, which was shotted. The anus was thus reduced in diameter so that it was barely possible for me to introduce the tip of one finger, whereas before the operation the ends of five fingers could readily be thrust into it.

A rubber drainage-tube was then introduced into the space between the rectum and the sacrum, and the wound leading backward from the anus to the coccyx was closed by numerous shotted-wire sutures carried deeply through the structures by means of a strong curved perineum needle. This procedure made the rectum diminish gradually in calibre as it approached the anus, instead of being, as it was previously, a sort of funnel-shaped cavity with its widest end towards the external opening. The new condition was as inhibitory to the occurrence of prolapse as the previous one was favorable to it. Owing to diarrhœa, which occurred a day or two after the operation, fecal matter obtained access to the space behind the rectal wall; and, as a result, suppuration, sloughing, and bleeding occurred. This interfered with the rapid healing of the divided structures, and destroyed what union had already taken place. On the fifth day I took out the wire stitches which had been inserted from the anus to the coccyx. It is possible that the diarrhœa which occurred was the result of the antiseptic washes, which, if I remember rightly, I employed through the drainage-tube. When I perform this operation again I shall endeavor to keep the rectum aseptic by packing it with gauze after the operation, and at the same time have the bowels confined by the use of opiates, so as to allow union by first intention to take place. The suppuration, sloughing, and secondary hemorrhage, which took place because fecal matter obtained access to the wound by the giving way of the rectal stitches, greatly retarded convalescence. It is possible, however, that the cicatricial contraction due to this inflamation added to the permanency of the cure effected.

For a long time after the operation, and even after the patient was discharged from constant supervision, there remained an opening posterior to the anus leading into a small cavity back of, and communicating with, the rectum. This eventually entirely closed. The patient rapidly gained flesh after the operation, became strong and vigorous, and was able to go up and down stairs without any tendency to prolapse. She had control of the contents of her bowels, and was cured of the disgusting condition which had existed for so many years.

An examination made by me in September, 1891, nearly two years after operation, revealed no evidence of prolapse, as far as could be determined by digital examination. The sinus had remained closed, the anus was small, and the mucous membrane was not protruding. The patient stated that sometimes there was a slight tendency for the lower portion of the bowel to appear at the anus, and that it was necessary for her to use enemas in order to empty the bowel completely and to get rid of the sensation of material in the lower end of the intestine. Inquiry repeatedly made did not convince me that this was anything more than a slight protrusion of the mucous membrane. There certainly was not enough anatomical change to give her much annoyance or prevent her attending to the ordinary duties of life. She was seen by me for other conditions a number of times, and I concluded that her anxiety about the state of the rectum was the result of her fear of a return of the trouble

—a mental attitude not surprising, considering her years of rectal disease.

I last saw her in April, 1892, when she was still well, though two and a quarter years had elapsed since the date of operation. The operation, therefore, was a satisfactory one, both to the patient and to me, and the cure effected has been permanent.

CASE II. *Dr. Bell's case. Posterior proctectomy for prolapse of the rectum existing for five years and associated with injury to the back; cure.* —The case of Dr. James Bell, surgeon to the Montreal General Hospital, which he reported in the *Annals of Surgery*, 1891, vol. xiii. p. 333, is as follows: A woman, aged twenty-two years, suffered from rectal prolapse to such an extent that simply standing in the erect position or walking a few steps caused a protrusion of the walls of the bowel of from four to six inches in length. According to her history, she, at the age of ten years, fell from a height of ten feet, receiving the force of the blow upon her back. This accident was followed by incontinence of urine, and after two years by diarrhœa, which persisted, more or less, for five or six years. About five years before she came under Dr. Bell's observation the bowel began to prolapse, but was readily returned. The tendency to extrusion increased until the condition was as stated above. The incontinence of urine had persisted. She had only imperfect control of the sphincter muscle; when diarrhœa existed she had no control whatever over the contents of the rectum. There was loss of sensation over the buttocks and on the posterior surface of the thighs and calves, though there was no paralysis of the muscles of the lower extremities. No history of paraplegia could be obtained as having occurred after the injury, which she received when a child, and from which her present condition seemed to date. It is seen that the clinical history of the patient was somewhat obscure, as usually happens in cases of disease of long standing. The anus was so dilated that a man's hand of ordinary size could be easily introduced into the rectum. It was the opinion of Dr. Bell that the prolapse was secondary to a paralysis of the sphincter muscle, which resulted from the injury received twelve years previously to the time of operation.

On May 22, 1890, he removed, by my method, from an inch and a half to two inches of the sphincter muscle and a V-shaped portion of the posterior wall of the rectum, the base of which corresponded to the section of the sphincter muscle. The apex of the triangular piece cut from the rectum was situated four inches up the bowel. Silk sutures were used to bring the edges of the rectal wall together and to unite the separated ends of the sphincter. The sutures used for the sphincter were stronger than those employed for uniting the rectal wall. A drainage-tube was then introduced at the coccyx, and carried up behind the line of sutures in the rectum. For eight days there was considerable inflammatory reaction. The temperature varied from 99° to 101° F., and on one occasion it reached 102° F. After the eighth day the temperature remained normal, and the patient was free from pain. The sutures were then removed from the sphincter and the drainage-tube withdrawn. A small sinus was discovered leading from the lumen of the bowel, just within the sphincter muscle, to the opening left by the drainage-tube. Through this some fecal matter passed during defecation. The patient had an uneventful convalescence; was allowed to sit up after six weeks, and was discharged in a little less than twelve weeks,

in better health than she had been for years. She had much more control of the sphincter muscle than before. No fecal matter escaped by the small sinus still existing at the point of the coccyx, through which a fine probe could be passed into the rectum, and there was no tendency to prolapse of the wall of the intestine.

The patient reported to the operator on October 28, 1890, who makes this note of the examination: "The wound was then completely healed, the control of the sphincter was good—much better than before the operation—and the general health excellent. She stated that for two months she had been actively engaged in doing housework, going up and down stairs, etc., and that no sign of prolapse had ever been observed." Dr. Bell, in his article, says further, that the operation recommended by Dr. Roberts is sound in principle as well as safe and simple in practice, and seems to leave little to be desired. He thinks that ventral fixation of the sigmoid flexure, as carried out by Dr. McLeod, of Calcutta, is theoretically objectionable.

I have obtained a later account of this patient from the operator, who under date of October 13, 1892, says: "The after history of my case of prolapse of the rectum, on which I operated by the method described by you, has been perfectly satisfactory. The patient, who lives about sixty miles from Montreal, presented herself for examination, at my request, in November, 1891. There had been no return of the prolapse, and she had almost perfect control of the sphincter—better than she had had for years before the operation. Her general health was greatly improved, and she expressed herself as delighted with the result. I have not heard from her since. I am still of the opinion that this operation is the best and most rational that has yet been proposed for complete prolapse of the rectum."

Case III. *Dr. Kammerer's case. Posterior proctectomy in a man, followed by permanent cure.*—At a meeting of the New York Surgical Society, October 28, 1891, Dr. F. Kammerer exhibited a man, aged forty-five years, upon whom he had operated by this method. The patient, who had suffered with the condition from boyhood, had, at the time of the operation, a prolapse of the walls of the rectum measuring about three and one-half inches. When the bowel was replaced three fingers could readily be introduced into the rectum through the relaxed sphincter muscle of the anus.

About one and one-half inches of the sphincter were removed, with a portion of the rectal wall extending upward about four inches. The walls of the rectum were united by a continuous catgut suture, which was also the method used for bringing the other parts of the wound together. The part of the cavity lying underneath the coccyx was packed with iodoform gauze, because it could not be entirely closed with sutures. The sutures through the sphincter muscle were reinforced by several deep sutures of silkworm-gut. After the parts united, a rectal fistule was left at the end of the wound near the coccyx. This closed, however, at the end of three months.

The operation, which had been performed about six months before the exhibition of the patient, was, according to the statement of the operator, a complete success. There was "no recurrence of the prolapse, cessation of catarrh and ulceration of the rectum, and perfect control over feces and flatus."

I received a letter from Dr. Kammerer last month (October, 1892),

in which he says, in reference to this case: "I can only add that the patient has had no recurrence whatever of his former trouble, and has complete control over his sphincter."

The history of these cases has been presented, because I believe that there must be merit in an operation which has proved so successful in curing every case in which, as far as my knowledge goes, it has been employed. The method has now the indorsement of two surgeons, who previously were unacquainted with me, and who in each instance were as successful as I in obtaining a permanent cure. The evidence of the utility of the operation is greatly reinforced by this testimony and by the long time after operation at which all the patients were subjected to re-examination.

LAPAROTOMY AND REMOVAL OF CYSTIC TUMOR (CYSTO-ADENOMA) OF PERITONEUM; FORMATION OF ARTIFICIAL ANUS; SUBSEQUENT LAPAROTOMY AND RESECTION OF COLON; CLOSURE OF ARTIFICIAL ANUS; RECOVERY.

By W. Page McIntosh, M.D.,
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On February 8, 1890, I was consulted by Mr. B. for pain in the region of the stomach. Upon examination I found a circumscribed swelling about midway between the lower curvature of the stomach and the umbilicus slightly to the left of the median raphé. The patient was not aware of the existence of this tumor, and, of course, was surprised and chagrined. He stated that he had been in poor health for some weeks, and had been wearing a plaster over this region, which, in his opinion, was sufficient to account for his not having observed the tumor. Inspection led me first to suspect aneurism of the abdominal aorta, the resemblance being so marked as to require careful physical exploration before the probability of this affection could be eliminated. The tumor, for such it was, undoubtedly contained fluid and pulsated feebly from transmission of force from the aorta lying underneath it; absence of lateral dilatation and bruit set aneurism aside.

The tumor was freely movable, dull on percussion; tapping with finger gave succussion, only slightly painful, the character of pain being dull and heavy, but constant. Digestion not materially interfered with.

Condition of patient being cachectic, with no specific history, he was advised that a course of tonic treatment was the first indication to be met, and that an operation for exploration and removal held out the only hope of cure.

The diagnosis made at this time was either a hydatid cyst of the liver or sarcoma of the omentum. At a subsequent visit an aspirating needle was introduced and some fluid drawn out; this resembled dirty serum, being of a sickly straw-color, slightly viscid and highly albuminous. The microscope showed no echinococcus hominis.

As is but natural, I suppose in his anxious condition he consulted, off and on, nearly every surgeon of any prominence in the city; the invariable opinion showed that doctors do sometimes agree. The consensus was: Certain death if operation for removal was undertaken; equally certain death, but in the future, if left alone. He was advised by one gentleman of prominence that if he were a woman the tumor could be removed with but little danger to life, but being a man, it was a presupposed foregone conclusion that such a procedure would be fatal, as it was rather late in life for the poor fellow to change his sex. (From newspaper reports, such a thing has recently occurred in an adjoining village: the man (?), raised and known to be such by *both parents*, as well as by friends, has taken unto *herself* a *husband*, and declares that a metamorphosis has taken place, and boldly asserts that *she* can and will fill the place of wife. The man she married says she is a female; both parents say she is or *was* a male.)

The first measurements taken of the tumor, on February 8th, showed it to be from the umbilicus to a fixed point on the rib during complete expiration: Left side, 4½ to 5 inches; right side, 3½ to 4 inches.

March 10. One month and two days later, the measurements on the left side were 6 inches; right side, the same—showing a difference of from 1 to 1½ inches on the left side and from 2 to 2½ inches on the right side. The measurements from antero-superior spine of the ilium to the umbilicus showed about the same increase.

In the meantime, the opinion of several very able surgeons, whom I had advised the patient to see, had been, without a single exception, that an operation for removal of the tumor was the only rational course to pursue, though the prognosis was gloomy.

Notwithstanding that the tumor continued to grow, the patient's general health had improved wonderfully. He was in good condition to stand an operation.

On the afternoon of April 22, 1890, in the presence of and assisted by Drs. Perry and Kalloch, of the Marine-Hospital Service, and Drs. Kelley and Smiley, of San Francisco, the operation was performed.

The patient having been anæsthetized, the abdomen shaved and washed in a 1:1000 bichloride solution, a rubber sheet fixed so as to protect the wound, the ordinary incision for a laparotomy in the median line, beginning about two inches below the stomach and extending about six inches in length, passing to the left of the umbilicus, was made.

The tumor (evidently cystic) immediately bulged up, but was retained in place, a trocar and canula being introduced, and a part of the tumor contents, about 3000 c.c. of a dirty, ropy fluid, allowed to escape. Macroscopically, this tumor presented the characteristic appearance of papilliferous cysto-adenoma, the adenoma containing fluid and being divided into a number of smaller papillary protuberances, giving it a nodular appearance. No metastases had taken place in the surrounding tissues, "which must have been the case had the stomach or intestines been the seat of infection" (Ziegler).

The attachments of the tumor to the surrounding tissues were so many and so firm that great difficulty was experienced in removing them; at one point in the descending colon the intestine was so thinned from pressure that one of the assistants, in drawing the intestine aside, tore the colon half across, giving rise to an undesirable complication. Both ends were secured to prevent escape of the fecal matter, and attempts to

detach the tumor continued. At another point, posteriorly, the attachments were so firm and extensive that a majority of those present advised the stitching up of the rents in the tumor, uniting the intestine, and closing the wound. The patient was somewhat weak and did not bear the anæsthetic well.

To quit the operation at this time appeared to me both cowardly and indiscreet, and a proceeding likely to bring odium upon the profession,[1] as it would be leaving the patient to almost certain death; even in case the wounds did not kill him, the original lesion would.

I therefore determined to make every effort possible to break adhesions. Passing my right hand down behind the growth I found that I could grasp the kidneys; assuring myself of the freedom of these organs, and continuing to explore, I found firm adhesions up and down. Steadying tumor with the left hand, having the right well down and behind, grasping the adhesions I gave one or two strong, quick pulls, a procedure I regretted a second later, for although breaking and tearing loose adhesions and detaching the tumor, I also found a stream of blood the diameter of a man's thumb—at least a gush of blood of such size and force as to place our patient's life in extreme jeopardy and lead to the conclusion that a large and important vessel had been ruptured. For the space of a second I more than regretted that I had not sewed him up when advised to do so. Requesting one of the gentlemen to pass the thermo-cautery, I seized a large sponge lying in a basin of hot water and applied it to the bleeding-point, combining heat and pressure, and in another second the flow of blood had stopped as mysteriously as it had started. Thermo-cautery not used, and would probably have been useless anyway. I could find no vessel to ligate, so left alone with hot sponge. No further trouble was met with, the only thing left now being the pedicle; this was the size of the little finger and *hollow*, arising apparently from the greater omentum; as stated, it was a hollow cylinder, and perhaps three or four inches in length; ligating it in two places, dividing between the two with scissors, the tumor was taken out; the growth itself was about the size of a man's head, and lobulated or papilliform, being subdivided into a number of smaller cysts, each communicating with the main growth.

Several gallons of hot water were poured into the abdominal cavity, and, with the hand, the intestines thoroughly washed; this was repeated several times, the last time only rinsing without putting in the hand. The torn colon was now stitched to wall of abdomen, leaving posterior wall of intestine intact. The patient was in such a critical condition that it was deemed best not to prolong the anæsthesia longer at this time, hence a resection of intestine was not undertaken.

The abdominal wound was closed, the patient given a hypodermatic of brandy and placed in bed, having been under the anæsthetic two and one-quarter hours. He did not fully recover consciousness until 12 at night, being nine hours from beginning of operation.

23*d*. Saw him again at 9 A.M. Slept quietly latter part of night. Pulse, 96; temperature, 99°; respiration, 18. Some thirst. Very little pain. Ordered whiskey, ʒij, which he vomited. Ordered hypodermatic injection of ¼ gr. morph. sulph. Passed catheter; drew ℥iv urine. Com-

[1] The case having attracted widespread attention.

plains of wind on stomach, and is nauseated. Ordered opii pulv., gr. j; quininæ sulph., gr. v, in capsule every four hours.

6 P.M. Temperature, 98°; pulse, 90; respiration, 22. Vomiting. Ordered Seltzer water and cracked ice. Vomited, off and on, all night. R. Acid. carbolic. et bismuth. subnit. in mint-water.

Still complains of wind on stomach. Urinated voluntarily; passed gas by rectum, first time since operation.

24*th*. 9 A.M. Temperature, 98°; pulse, 76. Passed urine naturally. Spent a fairly comfortable night. Allowed barley-water and milk diet. No vomiting since 4.45 P.M. yesterday. Passed gas per rectum. Was given half an egg and some chicken broth during the afternoon—retained.

6.45 P.M. Complains of severe pain. Gave hypodermatic of Magendie's solution. (R. Morph. sulph. et atropin. sulph.) Wound dressed; looks well.

25*th*. 9 A.M. Comfortable night; no pain; slept well. Temperature, 99°; pulse, 72; respiration, 12. Fairly good day. Some pain and heaviness in wound; slight headache; medicines and diet unchanged. Patient has been confined to back and not allowed to turn in bed.

27*th*. 9 A.M. Slept well; vomited; some pain; hypodermatic of Magendie's solution, gtt. viij. Used catheter: four ounces of urine. From this time on catheter had to be used several times daily.

Wound dressed; some fecal matter, also bloody discharge. Nausea and vomiting; straining very hard; abdomen distended with gas. Ordered: R. Quin. sulph. gr. viij, ac. sulph. arom. gtt. viij, mucil. acaciæ ℥ij. S. Inject per rectum. Quinine, acting as a tonic to the partially paralyzed bowel, caused discharge of considerable gas.

30*th*. 9 A.M. Temperature, 98.6°; respiration, 15; pulse, 96, small and hard. Wound dressed and considerable fecal matter removed. Several times during the night wound had to be dressed. Three operations from bowels (artificial anus); nothing passed through rectum except gas occasionally. Injection, tr. opii and starch. Only liquid food allowed during first weeks after operation.

May 2. 9 A.M. Heavy sharp pain in wound; cold perspiration on face and feet.

4*th*. 9 A.M. Suffers some from insomnia; dressings showed small quantity of pus; temperature and pulse normal.

6*th*. 9 P.M. Had slight chill to-day. Temperature, 102°; pulse, 82; respiration 16. No change in treatment. This was his only chill and highest temperature during his time in bed.

9*th*. Appetite poor; given egg and sherry; bowels moved several times daily.

11*th*. Temperature, 101.2°; pulse, 82; respiration, 20. Still suffers from diarrhœa; all passages from artificial anus; only a little flatus has passed through rectum since operation. Used an injection of nitrate of silver, gr. ij to ℥v water through artificial anus; no benefit. Wound necessarily dressed after each operation from bowels.

13*th*. 9 A.M. Temperature, 101.6; pulse, 84; respiration, 16. Enemata of starch and laudanum.

17*th*. Complains of severe pain in region of rectum reaching up to wound. Passed catheter, and pain relieved. During night suffered considerable, slept but little. Digital examination through rectum revealed no indications of abscess; same dull pain in lower bowel;

retention of urine; suppository—opii et belladonnæ et iodoformi; was allowed beefsteak.

23*d*. 9 A.M. Slept well; no pain; bowels regular. Sat up in rocking-chair for forty-five minutes; first time out of bed. Has been living on liquid food with an occasional steak; to-day ate an Irish potato, which was the cause, I presume, of a very restless night, with pain in the bowel and wound. Has been taking a tonic for some time. R. Tr. ferri chlor., tr. nucis vomicæ, ac. phos. dil.

27*th*. 9 A.M. Temperature, 98.6°; pulse, 84; respiration, 16. Still has diarrhœa and some pain; some bleeding from wound to-day, with pain. Hot applications to wound with an occasional injection of Magendie's solution for past few weeks.

31*st*. Much the same; had desire for food to day for first time.

June 3. Suffers some pain whenever bowels move; stitches removed to-day.

5*th*. Some soreness in wound, but able to sit up to-day for five hours.

10*th*. Has three to four operations from bowels each day; hot applications and laudanum enemata still used; also necessary to use catheter occasionally.

13*th*. Sitting up about half the time. Diet consists of steaks, bread, coffee; sleeps well; suffers some pain yet; bowels still loose. Find a diarrhœa from an artificial anus difficult to control, and on several occasions during the treatment I have had a stream of hot water injected into the rectum and out through the wound, both for remedial effect and to keep bowel patent.

Has been anxious for some time to have artificial anus closed.

On June 17th, assisted by Dr. Charles Blake, of this city, and nurse Miss Barlow, the patient was anæsthetized, and at 4 P.M. I did a second abdominal section on this man. The two ends of intestine were dissected loose from walls of abdomen, and as the mucous membrane was hypertrophied and everted, about an inch was resected from each end, bleeding vessels tied, a catgut mat fitted into either end, the ends approximated and stitched together by means of Lembert sutures, using silk for sutures; abdominal cavity cleansed by flushing with several gallons of hot water, thus cleaning and floating intestines into position at the same time; the abdominal wound closed, dressed with adhesive strips, borated cotton and bandage applied tightly, and patient placed in bed.

The operation occupied two hours' time; patient stood anæsthesia better than on former occasion, remaining unconscious only three hours.

At 9 P.M. was called again in haste, and found, upon my arrival, that patient had been bleeding considerably, the dressings being wet with blood. Proceeding at once to anæsthetize him, I again called in Dr. Blake and we opened the abdominal cavity and secured the bleeding-point, which proved to be a part of the omentum ligated at first, but from which the ligature had somehow slipped.

Wound again closed. Time under anæsthesia, two hours; frequent injections of whiskey were necessary. All ligatures and sutures used in this case were of silk. At 12.30, patient sleeping quietly; condition good.

June 19. 6 P.M. Temperature, 98.6°; pulse, 78; respiration, 16; much pain in right side; applied sinapism; has been vomiting, off and on, all day.

20*th*. Temperature, 98.6°; pulse, 102; respiration, 10. Still vomiting; the straining and retching cause great tension on sutures; is somewhat nervous, starting suddenly in sleep; twitching of muscles; micturates without trouble.

23*d* and 24*th*. Severe sharp pains in abdomen. Magendie's sol. gtt. vij. Wound dressed, found full of pus.

25*th*–27*th*. Temperature, 98°; pulse, 72; respiration, 12. Complains of a feeling of constriction in chest; sharp shooting-pains in wound. Wound dressed and found to be quite inflamed; injections of morphine and atropine kept up. Sleeping fairly well; wound looks better. Ordered enemata which returned unchanged; later in the day passed gas per rectum.

30*th*. Sharp pain through bowels relieved by injection, per rectum, of quin. sulph. in ac. sulph. arom. causing discharge of flatus; wound looks well; some vomiting; great pain; enemata brought some flakes of fecal matter; passes flatus through rubber tube.

July 2. Wound dressed; adhesive strips removed; packed wound with iodoform gauze.

3*d*. Enemata; bowels moved; passed one of the catgut mats, almost as good as when used; although sixteen days since used no evidences of beginning absorption at all.

4*th*. Wound dressed; stitches removed; vomited considerably; pain bad; hot cloths locally relieve. Suffers greatly from accumulation of wind or gas in intestine, this is readily relieved by enemata of quin. sulph. in ac. sulph. arom., and passing a rubber tube into the rectum to allow escape of gas.

7*th*. Pulse 90 per minute and weak. Ordered tr. digitalis. Fluid diet kept up. Passed second catgut mat perfectly good, unchanged. Has diarrhœa.

9*th*–20*th*. Temperature, 98.6°; pulse, 72; respiration, 10; takes one grain morph. sulph. in twenty-four hours. Bowels moved; had a formed passage. Sat up for an hour on 13th. Beef-tea per rectum. Some diarrhœa. Sat up two hours on 15th; feels better.

21*st*. Sat up most of time.

23*d*. Discharged cured.

The microscopic examination did not amount to much, as it threw but little light upon the pathology of the growth. From a number of sections made by myself, in one only did I find any indication of adenoma, the others showing normal peritoneal tissue. In form, the tumor very much resembled multilocular cyst or cysto-adenoma, being made up of a multitude of small and large cysts; its contents, "a ropy, turbid, variously colored fluid," very much resembled cysto-adenoma. The rapidity of its growth is somewhat against the idea of benignity, while the fact that no metastases had taken place is against malignancy. In about a year and a half there has been no indication of a return of the growth.

REVIEWS.

BEITRÄGE ZUR STRUKTUR UND ENTWICKELUNG DES CARCINOMS. Von E. NOEGGERATH, M.D., Prof. Emer. des New York Med. College. Mit 108 Abbildungen auf Drei Tafeln in Farbendruck. Pp. iv., 39. Wiesbaden: J. F. Bergmann, 1892.

CONTRIBUTIONS TO THE STRUCTURE AND DEVELOPMENT OF CARCINOMA.

THIS monograph is one of those beautiful pieces of work for which German investigators are so justly celebrated. The author's half-apologetic tone in beginning his preface is commendable to his modesty; but an inspection of the pages of his monograph must arouse an enthusiasm which makes such an introduction unnecessary. He says a work of this character is required to properly illustrate the subject, which would be impossible in an ordinary journal or a work of smaller dimensions. This is true, as will be agreed upon by every investigator who has endeavored to publish studies of this character in the usual serial journals. A sympathetic chord is struck in everyone who has studied the preparations obtained by precise aniline staining, when he reads, in the preface of Noeggerath's work, his plea for colored plates to reproduce such objects. So much depends upon the correct representation of the tints and shades of color in these staining reactions, that all the resources of the lithographer's art are called into play in the endeavor to put on paper the images of these beautiful microscopical objects. It is in this particular that the Germans excel; and here lies the difficulty which must confront the American observer when endeavoring to carry out such work. Certainly, black and white pictures, or photographs, can never adequately fulfil the requirements of such a case.

Another departure made by Noeggerath consists in having his drawings made from the preparations by a non-medical draughtsman, who, of course, was not biased by his preconceived notions. Such a method is evidently advantageous, providing the artist be sufficiently educated to correctly interpret and represent the minute details of these objects; but it will be exceptional for the author of a research of this character to find anyone to do justice to this important part of his work.

The question which forms the subject-matter of this splendid monograph is one of most absorbing interest at the present time. The problem of the etiology and development of carcinoma is being attacked with great vigor by many observers in all parts of the civilized world, and scarcely a week passes which does not witness some contribution to the subject. In the main, we may say that the theories relating to the origin of carcinoma are the parasitic and non-parasitic; and each theory numbers among its adherents some of the leading investigators of the time.

Peculiar bodies are found in the cells of carcinoma which are usually called "cell inclusions," and these bodies which were noted by Virchow and others, nearly fifty years ago, have been regarded as parasitic protozoa (coccidia) on the one hand, and as products of cell metamorphosis or cell degeneration on the other. Noeggerath first considers these cell inclusions and quotes the work of Van Heukelom, Kiener, Malassez, Wickham, Virchow, Welsh, and Ribbert. Wickham's studies on cutaneous psorospermosis are noted in detail. Noeggerath calls particular attention to the fact that Virchow, in 1851, described and illustrated the identical objects of Wickham, and considered them the result of an endogenous cell formation. In this time-honored investigation Virchow not only gave a description of the homogeneous intra-cellular bodies, but he also noted the large and small vacuoles, and considered them as developing in enlarged and altered nuclei. Upon this work of Virchow Noeggerath dwells with much emphasis, and he insists that, "had not this classical description which Virchow published forty years ago fallen into oblivion, the indisputable conclusions obtained through his description would alone have been sufficient to guide the adherents of the parasitic theory, after a short study, into the correct path." It is pleasant to note that the conclusions of Welsh, of Johns Hopkins University, find a place in this connection.

The studies of Ribbert are considered at some length, and in them Noeggerath finds much to coincide with his own observations and conclusions. All his work stands arrayed against the parasitic theory, and interprets the formations found in carcinoma cells as the results of nuclear changes.

In the second section of his work, Noeggerath enters upon his personal studies of the cell inclusions in a variety of carcinomatous tissue tumors. These inclusions are studied from their micro-chemical staining reactions, and the methods, as well as the results obtained by Noeggerath, are remarkably precise. In the first place, he employs a double stain of alum carmine and picric acid, and by this method obtains objects which correspond to the cell inclusions of the other observers. By this staining method the nucleus takes on the carmine stain, while, in the earlier stages of development, the inclusion remains unstained, or only lightly stained. In following the development of these included bodies, the author considers the *encapsulation of one cell by another as the preliminary step;* the enveloping cell applying itself as a protoplasmic layer about the enclosed cell, and showing its nucleus somewhere in the periphery. A vesicle unstained with carmine appears beside the nucleus of the enclosed cell, and this unstained body increases in size in the succeeding stages of development, in this way encroaching more and more upon the nucleus. On careful examination by high powers, it is possible to find the chromatin of the nucleus of the enclosed cell escaping in the form of fine granules into the cell protoplasm. Not only does this dispersion of chromatin occur in the original cell containing the inclusion, but it also extends to the nuclei of neighboring cells. To this dispersion of nuclear chromatin Noeggerath calls especial attention; and he terms the phenomenon "*karyoclasis.*" Eventually, the inclusion grows to such a size as to occupy the place of the original encapsulated cell, having appropriated, in turn, the nuclear and cell contents. At this stage the nucleus of the encapsulating cell still remains partly intact. This is the object which Wickham, and other French

students, regarded as fully developed coccidia lying in an enclosing cell. They made the error of not recognizing the outlying cell as the one which encapsulated the cell containing the inclusion. Noeggerath says this false conception of the relations of these objects goes through the whole literature—"not only the French."

On comparing his cell inclusions with the so-called "karyophagus" of other investigators, Noeggerath admits that the objects found in carcinoma tissue stained with picro-carmine might easily be taken as parasites; but, on applying the aniline staining agents, an entirely different appearance is produced. It is in the precision of these refined methods that the beauty and value of this work lies. Staining with gentian violet after Gram's method, or with safranin, fuchsin, or Noeggerath's five-color mixture, the vesicle which is but slightly stained by carmine takes on the *same stain as the nucleus of the cell.* In fact, these aniline stains demonstrate that the inclusion and nucleus are homogeneous; while in picro-carmine staining the inclusion appears as something heterogeneous. With the anilines the author could observe the stages in the transformation of the nucleus—enlarging, dispersion of fine chromatin fragments, and their transfusion into the cytoplasm. Hence he concludes that the described "karyophagus," or inclosed protozoön, is a deception produced by the method of staining, and if these intracellular formations are not protozoa, then the inclusions of Darier and Wickham must be stricken from this class.

Following the "karyoklasis" and dispersion of finely pulverized nuclear chromatin, Noeggerath noticed that the whole nuclear and cell contents disappeared; and eventually, only an empty cell capsule remained; and he ascribes this result in part as due to the mobility of the chromatin fragments, which wander from the nucleus and cell. Aside from this, he has often observed solid masses of chromatin with "tube-like" pseudopodia or processes, into which the minutely-divided chromatin flowed. Careful examination revealed the fact that the carcinoma cells were connected by this tube system with each other, and with the interstitial lymph spaces and lymph vessels. Such a circumstance would permit the diseased cells to discharge their juices into the circulating juices of the body. A fine nuclear dust could easily find its way into the blood by means of this tube system; and Noeggerath suggests, that in this way the toxic properties which the experiments of G. Klemperer have demonstrated in the blood of individuals suffering from carcinoma might be induced.

A consideration of the "parasites" of Sjöbring and of Russell now follows; and here the author has taken the rare, though commendable course, of criticising their investigations only after having personally studied the preparations which these men described, and which they kindly furnished him. He is convinced, after painstaking study, that the formations described by Sjöbring and Russell independently are probably identical, and are the result of nuclear metamorphoses. The "budding" and migratory" forms, for instance, he believes to be the budding and migration of nuclei as observed by Ogata, Auerbach, and Nussbaum, in certain histological objects. He further notes that the nuclear contents of these carcinoma cells show the chromophile matter of Auerbach and others, which may be differentiated into two distinct substances by double staining. For instance, by hæmatoxylin and eosin staining, the nuclear substance is found to stain in part

by eosin (eosinophile), and partly by hæmatoxylin (hæmatoxylinophile).

Concerning the presence of leucocytes in carcinoma, the author believes that not only the normal white blood-cells are present, but also germinating endothelial cells, and proliferating connective tissue cells; and he suggests that we will succeed in finding different physiological relations for the varying forms of wandering cells. Already the work of Grawitz has demonstrated the origin of the connective tissue leucocytes in awakened "slumbering cells."

In the third section of his monograph Noeggerath proceeds to further disprove the parasitic theory of carcinoma, and thus arrays himself with Baumgarten, Borel, Klebs, Hauser, Virchow, Welsh, and others. The arguments of Billroth in favor of a specific cancer micro-organism are offset by the opinions of Hauser, and Baumgarten, who argue from the standpoint of the heteroplastic nature of carcinoma tissue, and from the absence of contact infection in tissue surrounding the growing cancer. The work of Williams and Cramer is here referred to, in which they found an exact reproduction of the original tumor structure in the metastases in various organs. "Nothing of this kind is known in pathological mycology."

Hannau's transplantation experiments are now taken in hand, and Noeggerath says that, while we cannot deny the fact of the growth of these pieces of tumor, this would furnish no ground for an infection theory; for if normal epithelium will grow further after transplantation, it is not remarkable that carcinoma cells will proliferate under like conditions. In transplantation, the tumor develops from the *implanted cells;* in carcinoma arising independently, from the *elements of the affected organ.* The cells, with their acquired power of proliferation, are carried over in transplantation, and only reproduce their kind. Transplantation, in fact, is only a metastasis from one individual to another; and until a germ is isolated and cultivated outside of the body, which will produce carcinoma when planted, we must not regard transplantation experiments as proving the parasitic nature of cancer.

By another careful micro-chemical study of the coccidia in the rabbit's liver, as compared with cancer cell inclusions, Noeggerath further strengthens his convictions of the dissimilarity of these objects. Where coccidia are found in cells (rabbit's liver, etc.), the *nuclei are always found well preserved,* and never is the karyoclastic effect observed, as found in carcinoma cells.

The leucocyte fertilization theory of Klebs, and the asymmetrical mitosis theory of Hansemann are now considered. Concerning these, our author says that, even admitting them to have an etiological bearing in carcinoma, what produces this asymmetrical mitosis in the one case, or incites the leucocyte and epithelial cell to unite in this illegitimate manner, in the other?

By staining first with alum carmine, and then by Gram's method, Noeggerath was able to demonstrate the very interesting and important fact that certain leucocytes contain, in their substance, particles of the dispersed chromatin of the degenerating nuclei of carcinoma cells. Such leucocytes were most frequently observed in cells with irregular mitoses, and sometimes he found the leucocytes lying in the cells from which the chromatin had escaped. This observation speaks forcibly against

the theory of Klebs and Macallum, who maintain that the carcinoma cells appropriate the chromatin of the leucocytes.

In concluding this contribution, the author again directs attention to the universal presence in nuclei of the two chromophile nuclear substances as noted by Auerbach, Ogata, Luckjanow, Steinhaus, Macallum, and others—the red-staining substance ("erythrophile"), and the blue-staining substance ("cyanophile"). The remarkable work of L. Auerbach on this subject is detailed, for in this work the author finds confirmation of his own researches on carcinoma cells. More than this, Noeggerath ventures to suggest an hypothesis relating to the development of carcinoma on the ground of these researches. The hypothesis which he offers is that the nuclear metamorphoses which his studies have shown to be always present in carcinoma, originate in a changed equilibrium between the normal proportion of erythrophile and cyanophile substances in the nucleus of the cell which becomes malignant. This hypothesis is given merely as a suggestion, as its author admits the inadequateness of our present knowledge to demonstrate its bearings. It serves, however, to direct investigation into this new and promising field, and in doing this the present object of its propounder is fulfilled.

To properly appreciate a work of this character, touching, as it does, on so many aspects of this important subject, it should be carefully read until every point is clear, then it should be laid beside the microscope, and each figure and description verified by means of preparations made by following the writer's methods.

Taken as a whole, this monograph ranks as one of the most important contributions of the present time to our knowledge of carcinoma structure and development. In its light, many of the contributions of the last few months on carcinoma parasites must be regarded with grave skepticism. In fact, Noeggerath's marvellous study of nuclear metamorphoses *must forever remove the cell inclusions of many authorities from the list of parasites.* A. P. O.

NAPHEY'S MODERN THERAPEUTICS. VOL. I.: GENERAL MEDICINE AND DISEASES OF CHILDREN. By ALLEN J. SMITH, M.D., Assistant Demonstrator of Morbid Anatomy and Pathological Histology, Lecturer on Urinology, University of Pennsylvania; Physician in the Dispensary for Diseases of Children, University Hospital, etc.; and J. AUBREY DAVIS, M.D., Assistant Demonstrator of Obstetrics, University of Pennsylvania; Assistant Physician to Home for Crippled Children, Philadelphia. Ninth edition, revised and enlarged. Pp. xx., 1034. Philadelphia: P. Blakiston, Son & Co., 1892.

IN reviewing a book which has found a place and filled it so well that it has reached its ninth edition, criticism might seem superfluous. Although in comparing this with previous editions we readily find great improvement in the quality of the matter, yet even this edition leaves an opportunity for further work. Medical science is advancing, in that it rests each year upon a more solid foundation, as pathology, physiology, and chemistry give a more accurate basis for the practical side of it—therapeutics. While much that is obsolete has been eliminated, more

that is new has been added, so that the work gives a very satisfactory picture of the treatment as directed by the best clinicians of to-day. We are somewhat surprised to find the terminology of the Pharmacopœia of 1870 retained—morphia, iodinium, glycerina, instead of morphina, iodum, and glycerinum, although the last occasionally appears. We note many typographical errors; a few are chinopodium, bacarum, tolutanti, aq. comp., chloramid, and althæ, which, in the nominative case as well, has proved a stumbling-block. Dobell's solution is correctly given on p. 69, while on p. 66 practically the same formula is credited to another physician. Of the fifteen hundred and eleven formulæ, containing many valuable suggestions and adding greatly to the usefulness of the work, several are repetitions; for examples, Nos. 108 and 161, 708 and 1469, while 807 and 856 are doubtless intended to be identical. There are but few misstatements of fact, but undoubtedly the distinguished inventor of intubation will be surprised to learn that "the laryngeal tube is further kept within control by the attachments of silken threads." In the mention of creasote we do not find a valuable method of administration, namely, by means of enteric pills.

On p. 213 is given Durand's formula, which is, on page 215, incorrectly stated to consist of equal parts of ether and turpentine. The qualifying adjective "fluidum" is variously placed in relation to "extractum" and the name of the plant; more uniformity is desirable. We believe that an apothecary, if requested to fill a prescription calling for "citro-amoniated iron pyrophosphate," would be very likely to seek information from the prescriber. A few prescriptions written in the metric system have crept in, which should be, but probably are not, intelligible to the average practitioner. In the main the use of capitals and of abbreviations by the authors is commendable. A striking feature of this work is the total absence of errors, which, if present, might result seriously to patients. However, the prohibition of castor oil, or any other oil for that matter, after the administration of male fern, should be insisted upon; on this point recent literature speaks with no uncertain sound. There are a few instances of remedies mentioned for unaccustomed uses, as cocillana—which, by the way, appears as "cocillama" in the index—being recommended for habitual constipation, and not being cited as a valuable expectorant in bronchitis, catarrhal pneumonia, and phthisis, which it is believed to be, and which has a literature.

There are to be found some contradictory statements; the relation of uric acid to urea is given on p. 409 as 1 to 30, on p. 469 as 1 to 35, while Haig, the author quoted, in his book states it to be 1 to 33. In the sections devoted to Diseases of Children, the articles upon the Clinical Examination of Children are good, in particular that of Professor Ledamenda, while Infant Feeding is discussed in a way that is thoroughly satisfactory. In the Index of Authors are a few misspelled proper names, and we note that Dr. Calvin Ellis is credited to England instead of Massachusetts. Naturally, in a work like this, symptoms must needs be discussed as well as diseases, and this must be borne in mind, but with a realization that asthma represents the former, and bronchitis the latter class, the reader will always find something of value. No practitioner can fail to profit by a careful study of this work: the junior, to find out what the leading physicians of the world have considered to be of value in the treatment of disease; the physician of mature years, to enlarge his working resources and lift himself above the level of routine, and

modernize his treatment. As a work, it occupies a middle ground, between the System, with its diffuseness and personal experience of the limited number of authors, and the Index of Remedies, barren of indication, and misleading to the recent graduate. This is pre-eminently a book for study, and no practitioner can use this work as it should be used without acquiring a broader knowledge and a more efficient armamentarium. Only one who has written or edited a work on therapeutics knows the very great difficulty which is encountered in keeping out the errors to which attention has been called in this review. Yet, while these errors mar, to some extent, the beautifully printed volume before us, they by no means detract from its value as a guide to practice.

R. W. W.

THE MASTOID OPERATION: INCLUDING ITS HISTORY, ANATOMY, AND PATHOLOGY. By SAMUEL ELLSWORTH ALLEN, M.D. 8vo., pp. 111. Cincinnati, Ohio: Robert Clarke & Co., 1892.

THIS little book gives a very good account of the German idea concerning mastoid inflammation and methods of its surgical treatment. As the rather pretentious title indicates, it erroneously assumes that there is great and frequent necessity for operating by perforation, upon the mastoid portion of the temporal bone. The fact is that surgical perforation of the mastoid cortex is one of the rarest operations an aurist will be called upon to perform.

Acute inflammation of the mastoid cells in a previously healthy ear, sufficiently intense to demand perforation of the mastoid cortex, rarely, if ever, occurs. Many aurists of large experience have never seen it. Hence the necessity for "the mastoid operation" can be thrown out of consideration in cases of acute otitis media with mastoid congestion. If simple acute suppuration of the mastoid cells ever occurs in a previously healthy ear, some form of the old-fashioned gimlet operation on the unyielding cortex of the mastoid will give the best results. In fact, in any case some form of boring operation on the mastoid is preferable to the use of hammer and chisel, with its inevitable shock to the cranial contents.

Unfortunately, of late years there has been a growing tendency to consider the pain, congestion, and œdema, often found in connection with acute otitis media, as indicative of intra-mastoid suppuration, and as calling for mastoid trepanation. Possibly, in acute otitis media there is often some suppuration in the mastoid cells; but this finds its way out through the aditus ad antrum into the middle ear and is discharged from the external meatus. One thing is very certain—that the symptoms of late erroneously attributed to intra-mastoid suppuration, and which have induced some surgeons to open the mastoid cavity, where they report that rarely pus is found *at first*, are the same old symptoms that have yielded in many other cases to internal and external antiphlogistic treatment, including in some cases a Wilde's incision through the soft tissues over the mastoid.

When we turn to *chronic purulency* in the middle ear, with caries and

necrosis of the mastoid, we find altogether another set of symptoms and very different surgical indications.

It may now become necessary to open the mastoid cortex and expose the mastoid antrum and cells, in order to remove necrotic tissue and prevent the encroachment of the carious process upon deeper parts of the cranium. So much the aurist many be called upon, now and then, to do, if he can assure himself that the necrosis is limited to the mastoid cavity. If necrosis has invaded deeper parts of the cranium, then opening the mastoid is only the preliminary to a deeper surgical penetration of the cranial cavity for the relief of extra-dural or cerebral abscess, or for the examination of the lateral sinus. If the latter is found in a state of thrombosis, and if this condition has extended to the internal jugular vein, the indications are to ligate the jugular, and turn out the thrombus from it and from the sinus.

Manifestly now the only one qualified to operate on the mastoid is the general surgeon, whose daily experience amply qualifies him to successfully carry out *all* the surgical indications for the relief of the sufferer.

Aurists will confer greater benefits upon mankind by confining their attention to the relief of deafness and the cure of chronic purulent otitis media. By doing the latter they will prevent mastoid necrosis, sinus-thrombosis, and cerebral abscess. Whenever an aurist has diagnosticated any of the last-named conditions, he should invoke the aid of the general surgeon, just as the general practitioner summons the general surgeon to relieve empyema of the thorax.

Regarding the form of instrument to be used in opening the mastoid, some kind of boring instrument or drill propelled by the hand or the dental lathe, or some form of rongeur or bone-forceps is preferable to a chisel and a hammer, as the latter combination unavoidably communicates more shock to the brain than a cautious surgeon would be willing to convey to that organ.

The illustrations in this little book are very good, but there are some curious typographical mistakes, such as *mastoides* (pp. 34 and 72) for *mastoideus*, *Monatschrift* (p. 16) for *Monatsschrift*, *Archives* für Ohrenheilkunde (pp. 9, 56, 68, and 69) for *Archiv* für Ohrenheilkunde, and *Trölsch* (p. 68) for *Tröltsch*, which we may hope to see corrected in another edition. C. H. B.

SYPHILIS AND THE NERVOUS SYSTEM. Being a revised reprint of the Lettsomian Lectures for 1890, delivered before the Medical Society of London. By W. R. GOWERS, M.D., F.R.C.P., F.R.S. 12mo., pp. viii., 131. Philadelphia: P. Blakiston, Son & Co., 1892.

THESE lectures, which are already familiar to the medical public from their appearance in various medical journals, are now made more accessible by publication in their present form. They are rather a guide to the proper methods of study of syphilis as it affects the nervous system than an elaborate review of our present knowledge upon all the details of lesions, symptoms and treatment, and as such a guide they are worthy of the consideration of every physician who wishes to

deal understandingly with the subject. We look in vain for any detailed description of the gumma, the growths in the arterial walls, or meningitis, but instead we find the author pointing out that these are the specific lesions of syphilis peculiar to it. Beside these, he distinguishes other lesions, due to syphilis, but not peculiar to it, except in some cases by their distribution or seat. In many of these lesions, especially those of a congestive or inflammatory type, we cannot yet say definitely whether they are syphilitic lesions or not. Bacteriology may aid us in the future, but as yet it affords no help. We must determine such points by the evidence of such sequence as proves causation, and the evidence of therapeutics. The evidence from therapeutics, although so often employed, is of only limited value, and the lecturer points out the conditions under whicl it can be of assistance—conditions so stringent that the practitioner who argues glibly that a trouble must be syphilitic because it yielded to anti-syphilitic treatment will find, should he venture to apply them, that the foundations of his beliefs are far less substantial than he thought. Finally come the degenerative processes, where the evidence from sequence is alone of service, and here the lecturer accepts Erb's and Fournier's views, and inclines to Strümpell's hypothesis of a chemical poison. In the lecture on symptomatology, too, we find the subject treated in the same way. Individual symptoms are for the most part ignored, but the lecturer points out the questions which must be met in the individual case: Where is the lesion and what is its nature? May it be syphilitic? Has the patient had syphilis? Can any other cause be traced? Does the result of treatment confirm the conclusion of syphilis? These questions, as well as the questions as to the pathology, he illustrates incidentally from his own experience, occasionally citing statistics, or dwelling upon some special point in detail. Having pointed out the conditions upon which prognosis must be based, the lecturer commits himself to the assertion that syphilis is incurable—that is, that there is no evidence that that which causes the manifestation of the malady ever is or ever has been cured.

To the neurologist, especially, dealing only with the consequences of the disease or with its late manifestations, appearing years after recovery from the symptoms of the first attack, such an assertion may be readily accepted, but it is hardly justified. Our knowledge is yet too inadequate for us to say that a man who has once had syphilis is exempt from any further consequences of the disease, and that no treatment can make him exempt; nor is it any contradiction to this statement to say that he may live his life through before any further consequences manifest themselves. In a very few cases, however, the system seems to be so free from any trace of the disease that a second infection occurs. Such cases, although we cannot predict which they are, must be regarded as proving the possibility of a cure. In the treatment of the disease the lecturer has found no case of intra-cranial disease which indicated that mercury had succeeded where iodide had failed. In the administration of iodide, moreover, he cautions against its use for more than eight or ten weeks. He holds to energetic treatment for short periods, believing that long-continued treatment by small doses is dangerous, since it accustoms the patient to the drug. One method alone is "sure" in the prophylaxis, and that is unbroken chastity—which, unfortunately, is not absolutely sure. "With all the knowledge I possess, and any authority I have

can give," he concludes, "I assert that no man ever yet was in the slightest degree or way the worse for continence or better for incontinence." P. C. K.

HYGIENE AND PUBLIC HEALTH. PRACTICAL SERIES. By LOUIS C. PARKES, M.D., D.P.H., Lond. Univ.; Fellow of the Sanitary Institute and Member of the Board of Examiners; Lecturer on Public Health at St. George's Hospital Medical School; Medical Officer of Health, and Public Analyst for the Parish of Chelsea. Pp. 523. Philadelphia: P. Blakiston, Son & Co., 1892.

PERUSAL of this work cannot but cause surprise that such a mine of misinformation should bear so recent a date, and it is hardly possible to conceive that a book containing so many statements remarkable only for their inaccuracy should have lived to reach a third edition. One cannot help feeling that it is just as well that many important subjects are either entirely omitted or discussed at no length, and on the other hand it may be considered that no great harm can come of handling comparatively trivial matters with a wealth of detail.

The chapter on Water might well have been written a quarter of a century ago, for the author has not seen fit to avail himself of the great fund of information which has been given to the scientific world by the researches of recent years. Perhaps there is reason for this, for in England that tiresome body, the "Rivers Pollution Commission," is looked upon as the chief, if not the sole, authority on this subject.

Chapter II., which takes up more than a fifth of the entire volume, treats of the collection, removal, and disposal of excretal and other refuse. The author's remark in the preface that "the chapter on Removal of Excreta is, perhaps, somewhat unduly lengthy in proportion to the size of the whole book," can be cordially indorsed, but his reasons for its length are by no means a sufficient excuse. Much of this chapter is not worth the space which detailed criticism would require. The chapter on Air and Ventilation has a value about equal to that of the one on water. The method given for conducting an analysis of air demonstrates that the author is as unfamiliar with the proper methods for this work as he is with those for the analysis of water. In this chapter one may learn that the "practice of placing cases of diphtheria in wards occupied by patients suffering from mixed diseases is not unattended by danger," and that "a feeling is gaining ground that special wards should be provided for this and other diseases"—and this was not written, as might be supposed, twenty-five years ago, but in 1892. It is to be hoped that the author will in no way relax the vigor of his language, and that he will do all that lies in his power to foster this feeling and aid it in gaining ground.

The chapters on "Warming and Lighting," "Climate and Meteorology," and "Soils and Building Sites" are very short—and it may be added, fortunately so. The chapter on "Food, Beverages, and Condiments" makes up in quantity what it lacks in quality. "Exercise" is disposed of in three pages, and "Clothing" in seven. Chapter IX., on "The Contagia; Communicable Diseases and their Prevention; Hospitals," while very bad, compares favorably with the rest of the book.

It is a pleasure to note that, although the book is one that ought not to have a wide circulation in this country, it is not entirely without merit; it is well printed and the index is excellent. C. H.

KIRKES' HANDBOOK OF PHYSIOLOGY. By W. MORRANT BAKER, F.R.C.S., and VINCENT DORMER HARRIS, M.D. Lond., F.R.C.P. Thirteenth edition. 8vo., pp. 884. Philadelphia: P. Blakiston, Son & Co., 1892.

No text-book that has successfully held its own through twelve editions in the struggle for existence needs the words of the reviewer to attest to its popularity or usefulness in the past. As an elementary book for the student, the present edition of Kirkes compares very well with most of the newer works of like nature; it has been ably revised, and, by the introduction of considerable new material, brought well abreast of the times.

That the editors have added little or no original matter in this edition will be of small moment to the busy practitioner and hard-pressed student, for whom the work is designed; to them its systematic arrangement and concise style will be particularly attractive and valuable.

So wide is the modern field of physiological knowledge that it has become no easy task to include within the scope of a medium-sized work the consideration of all that we now rank as important. In the Handbook the condensation of material has been, on the whole, judicious, but there are a few subjects which have hardly received their due share of attention; for instance, in the section devoted to the heart no reference whatever is made to the coronary arteries and their relation to cardiac action, a subject which, from its medical importance, is deserving of mention at least.

From the standpoint of those who attend our better colleges, in all of which excellent courses on microscopical anatomy are now given, probably an unnecessary amount of space in the book has been devoted to the histology of the tissues and organs; but for students whose opportunities are more restricted, and for practitioners wishing to revise the teaching of their younger days, this feature—to which the number and excellence of the illustrations add much—will be of especial value.

It is safe to predict, therefore, that the present edition of Kirkes' Handbook will meet with a success fully equal to that of former editions, and that it will continue to enjoy its due share of popular favor and confidence. F. W.

A HANDBOOK OF HYGIENE AND SANITARY SCIENCE. By GEORGE WILSON, M.A., M.D, F.R.S. Edin. Pp. 751. Philadelphia: P. Blakiston, Son & Co., 1892.

IN pleasing contrast to the work of the younger Parkes is this excellent book by Wilson. This is the seventh edition, and contains considerable added new matter, and most of the book has been thoroughly revised and brought up to date.

Chapter I. is introductory. Hygiene is defined, and a very interesting historical sketch is given of its progress from earliest times. The chap-

ter on Food treats of the functions and constituents of foods; food and work; construction of dietaries; preserved foods; diseases which render flesh of animals unfit for human food; examination of food, and the effects of insufficient or unwholesome food on public health, and these topics are well and interestingly handled. Much might have been added, however, to the value of this chapter had the author gone fully into the matter of adulteration of foods, which subject is certainly of very great hygienic importance. Of the chapter on Air, its Impurities and their Effects on Public Health, it may be said that while it is as a whole very good, it is hardly the best place to introduce the hygiene of occupation, which is a subject large enough to deserve a separate chapter and more extensive treatment.

Ventilation and Warming are, naturally enough, written to suit English climate and other local conditions. The method for conducting analysis of air is both well described and clearly explained.

The chapters on Water, Water Analysis, and Effects of Impure Water, are, as is usually the case with English books on hygiene, quite disappointing and far from being up to date, and the same may be said to a lesser extent of the chapters relating to Sewage.

The chapter on Climate and Meteorology is extremely interesting and instructive, and the same is true of the chapters on Communicable Diseases, Prevention and Disinfection, and Disposal of the Dead. The latter topic is usually handled with either an excess of sentiment or exaggerated ideas as to the danger of earth burial. This author, however, goes to neither extreme, and his sensible observations are a pleasure to read.

Other subjects treated in an interesting manner are soils, dwellings, hospitals, and vital statistics. The work closes with a chapter on the English Sanitary Laws and Official Duties of Medical Officers of Health, and an appendix.

As a whole the volume is to be highly commended, and deserves wide circulation. C. H.

PRACTICAL AND ANALYTICAL CHEMISTRY: A COMPLETE COURSE IN CHEMICAL ANALYSIS. By HENRY TRIMBLE, Professor of Analytical Chemistry in the Philadelphia College of Pharmacy. Fourth edition, with illustrations. Philadelphia: P. Blakiston, Son & Co., 1892.

THE appearance of a fourth edition of this little work makes it apparent that it has met a want, and that its arrangement and contents are acceptable for the purposes for which it is intended, *i. e.*, for instructing the student in qualitative and some parts of quantitative analysis.

The author has arranged it in three parts, the first of which is an introduction to practical chemical work by the preparation of some of the elementary bodies and their compounds. The second and principal part is devoted to qualitative analysis summarized in charts, and in the third part the principles of gravimetric and volumetric analysis are given in a brief manner.

Although the book seems principally intended for students of pharmacy, it will also prove, by its concise and practical arrangement, a good and safe guide for the student of medicine in his practical studies of general chemical analysis, as well as for the physician who may be called upon to do analytical work. L. W.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.A., M.D., LL.D.,
PROFESSOR OF CLINICAL MEDICINE AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; ASSISTANT VISITING PHYSICIAN TO BELLEVUE HOSPITAL.

Some Drugs used in Chorea.

Dr. Arthur A. Boyer believes that there are two things which impress the student of therapeutics as applied to functional nervous disorders: First, the necessity for pushing familiar drugs to their physiological limits; second, the large number of new drugs reported as accomplishing startling results without a sequence of dangerous or unpleasant symptoms. The main reliance is on some drugs in excessive doses, and on others having profound effects; thus we are warranted in drawing some information from positive lesions the results of toxic doses of the drugs in question.

Of the drugs used in chorea, arsenic stands first and foremost. The effects of full medicinal doses long continued are, in many respects, similar to the toxic, which must, so far as possible, be avoided. There are many patients who, after having taken this remedy in moderately small doses from six months upward, bear characteristic marks of their treatment. The skin is pale, often sallow to the point of muddiness, the air is languid, the gait rather uncertain, the hands moist, flesh flabby, appetite poor, habit constipated, heart's action feeble (frequently accompanied with palpitation or irregularity), pulse soft, and respiration shallow. There is a lack of tone in the muscular system, which can be shown with accuracy in the case of the extrinsic muscles of the eyes, which are found to be in a weak state bordering on paresis. With an esophoria of high degree, the nasal rotation is poor; with an exophoria, the temporal rotation is imperfect; abduction and adduction are usually limited. The therapeutic effect of arsenic is probably twofold in chorea: primarily a depression of the spinal centres by reason of the poverty of the blood; in the second case, and to a much less degree, a reduction of the working power of the muscles by the direct effect of the drug. Chloral is useful in chorea, chiefly in the acute and violent cases, when the hypnotic

effect of the drug is pushed to the point of producing coma, and the patient kept under its influence until the nervous centres have had time to regain their lost equilibrium. The symptoms of chloralization are cited, and the doubt is expressed whether, from the large amount of the drug required, the effect is produced through its hypnotic action, so much as by the profound depression of the brain and spinal centres and direct action on the muscles themselves. The various antipyretics have been recently used, and, in some respects, they have a similar action. Antipyrine, it may be conjectured, effects a decrease in the excitability of the muscles themselves by the direct action of the drug, while the sensory centres in the spinal cord are depressed by degenerative changes in the blood. Thus in all remedies which have won reputation in chorea, the feature of most prominence is their power to cause a depression of sensation and motion to the point of paralysis; that in doses short of this effect they are not of much value; and, finally, that when they are administered in doses sufficient to check choreic movements, other systemic effects, such as general depletion of the forces of the body, degeneration of the blood, vascular dilatation, and cardiac and respiratory depression, attend their specific action.—*The Journal of Nervous Diseases*, 1893, No. 2, p. 112.

The Physiological Action of Thymacetine.

Dr. E. Marandon de Montyel has studied this drug, which is supposed to be an analgesic, hypnotic, and narcotic in dose from seven to fifteen grains. From his observations upon healthy human subjects, he believes that of all the influences exercised upon the economy by the drug, that upon the nervous system has been, without dispute, one of the most feeble; set forth as an analgesic, it shows itself to be without action upon the different sensibilities. Nor, indeed, does it show itself as a hypnotic, for it is demonstrated to be incapable of imposing sleep upon organisms which have not an urgent need of it. As for its action upon the intellect, it has appeared to be always absolutely *nil;* the mental condition has not been at all modified by it. The only changes in the cerebral functions produced by it have been stupor, with slight intoxication and headache; the latter is frequently met with and is most persistent. The muscular force appears to be increased, and the temperature is frequently elevated to half a degree or more. This drug increases the number of inspirations, the arterial tension, and the rapidity of the pulse. As for the secretions, it is not a diuretic, although it gives rise to symptoms on micturition, even to marked pain; it produces a marked and persistent bitterness in the mouth, a coated tongue, although the breath is not affected. It frequently excites heat and burning in the epigastric region, along the œsophagus, although of short duration, and these sensations may extend over the whole body. A marked thirst, which is impossible to satisfy, may persist all day and even at night; it may give rise to nausea without vomiting, or vomiting, total anorexia, and even notable gastric difficulty. The subject soon, however, becomes habituated to the drug, and all symptoms, save those of the digestive system, are diminished. The indications for the use of this remedy present great difficulty, for in the treatment of insanity it does not apparently possess any action upon the intellectual cortical centres.

Its efficacy as a sedative, and with greater reason as a hypnotic, is doubtful. In ordinary pathology, perhaps the spasmodic constriction of the ureterovesical sphincter which it produces may be utilized in certain cases of incontinence of medullary or neuropathic origin, but unfortunately this influence is very transient and is one of the first to disappear on habituation to the drug. —*Bulletin général de Thérapeutique*, 1893, 4e liv., p. 49.

The Treatment of Alcoholic Delirium.

Dr. E. Lancereaux believes that this is one of the class of toxic deliriums, due to the specific action of the alcohol upon the cerebral elements, and the excitement is the cause of the insomnia and of the death which generally takes place from nervous exhaustion. Sleep, then, is necessary to control the delirium, and is the principal indication, and all means must be employed. To isolate the patient in a dark chamber, where nothing can excite the senses—if there is fear of his doing injury to himself, in a padded room—but to avoid the *camisole*, as it is likely to give rise to exhaustion: these are essential. Of the remedies which localize their action upon the nervous elements and moderate their reflex excitability, are the bromides, opium, morphine, and chloral. The bromides have not the energy of other means; their action is slow and will be put aside if the delirium is acute. Opium and morphine are advantageously employed, on condition that they produce sleep; but if large doses are necessary, it is preferable to use, instead, chloral, of which the effects are more certain and rapid. One condition is important—that the dose shall be sufficient to produce sleep; otherwise, instead of calming the unfortunate patient, it excites him. The dose, under these conditions, is sixty to ninety grains of chloral in five ounces of sweetened infusion of limes with an ounce and a half of syrup of morphine. If this does not produce sleep in ten minutes, one-sixth to one-third of a grain of morphine is hypodermatically injected, and the physician remains with the patient until he sleeps. If it be necessary, a second dose of chloral is given. The delirium ceases within twenty-four to forty-eight hours, and in some cases the patient can resume his occupation.—*Bulletin général Thérapeutique*, 1893, 6e liv., p. 122.

[The amount of chloral, as given, is considerably in excess of that usually deemed safe; however, the great urgency of certain cases may justify this dose.—R. W. W.]

Haffkine's Method of Vaccination against Asiatic Cholera.

Dr. A. E. Wright and Mr. D. Bruce give the details of this method as demonstrated by M. Haffkine, at Netley. This method is a process of chemical vaccination to bring about protection against cholera by acclimatizing the system first to a weak cholera poison (first vaccine), and afterward to a strong cholera poison (second vaccine). For adequate protection it is essential that this second vaccine should consist of the strongest obtainable cholera poison. The object which this vaccination has in view is to enable the system to tolerate such quantities of cholera poison as might be expected to be absorbed from the intestines during the interval which elapses between the invasion of the alimentary canal by the comma bacillus and the natural

elimination of that bacillus, which invariably takes place when convalescence becomes established after an attack of cholera. It does not aim at the impossible task of establishing a complete tolerance for an indefinitely large quantity of cholera poison. From laboratory experiments it is proven that these vaccinations do establish a high degree of tolerance for cholera poison in the case of guinea-pigs and for the "exalted" cholera virus in the case of rabbits and pigeons. The vaccines consist of emulsions of attenuated, and of "exalted" cholera cultures. They may be either of living cholera bacilli (living vaccines) or of bacilli which have been killed by the action of dilute carbolic acid (carbolized vaccines). The former present the advantage of possessing a more powerful vaccinating power; the latter, that of being perfectly safe to handle or leave about, and they do not appear to be appreciably impaired by keeping. An attenuated culture is prepared by a method in which the cholera bacillus is grown in media which are continually aërated at a temperature of 102.2° F. The "exalted" culture is prepared by growing the cholera bacillus in the peritoneal cavities of a series of guinea-pigs. As each guinea-pig of the series dies, the fluid which is found in its peritoneal cavity is removed, and afterward inserted into the peritoneal cavity of another guinea-pig, and so on through a series of twenty or thirty animals. The difficulty of keeping the fluid of the peritoneal cavity free from contamination during such a series of "passages" is very great, and can only be obviated by strict attention to antiseptic details. In passing the virus from one guinea-pig to its successor an intercalation of an interval of aërobic growth is necessary. This is obtained by placing the test-tube containing the peritoneal fluid in an incubator at 95° F. in such a position as to expose the greatest amount of surface to the atmospheric air for eight or more hours. This permits the multiplication of the comma bacilli in the presence of oxygen. The size of the guinea-pig chosen for the next animal in the series must be governed by the amount of peritoneal fluid obtained from its predecessor, and since large exudations, from the considerable amount of resisting power of the animal, are likely to contain few comma bacilli, a smaller animal should be chosen. The vaccines are prepared by inoculation of a standard agar tube from a pure culture; these tubes are then placed in an incubator at 95° F. for twenty-four hours. A small quantity of sterilized broth is then introduced into the tube and the layer of bacteria scraped off from the underlying agar and beaten into a fine emulsion. Carbolized vaccines are prepared in precisely the same manner, excepting as regards the fluid in which the emulsion is made, which is a 5 per cent. solution of carbolic acid, previously sterilized. Carbolized vaccines are preserved by sealing them in capillary tubes into which they have been aspirated. The vaccines are hypodermatically injected, under antiseptic precautions, by a simple syringe. The injection is made into the subcutaneous tissues and not into the depth of the muscles. The seat of election is under the skin of the flank half-way between the crest of the ilium and the lowest rib. The inoculation of the first vaccine is made from three to five days before the inoculation of the second. If the first vaccine is inoculated into the right flank, the left flank is to be chosen for the inoculation of the second vaccine.—*British Medical Journal*, 1893, No. 1675, p. 227.

The Intermittent Administration of Quinine in Malaria.

Dr. Francis H. Williams presents very satisfactory evidence of the value of this method of administration of quinine, taking the temperature, and not the chill, as a guide. He has studied eighteen cases: twelve tertians, five quotidians, and one of irregular type. In some instances the diagnosis was established by finding the *plasmodium malariæ* in the blood. The dose of the quinine was twenty grains in solution, administered when the temperature began to fall, and the same amount upon the seventh, fifteenth, and twenty-second days. This method lessens cinchonism, which is apt to follow continuous doses, and as well the amount of the remedy which is necessary, and looks to the prevention as well as to the cure (Plehn). The remedy should not be given in pill form, but in solution, or, if it is important to consider the taste, in powder or in capsule. It is advantageous to give a cathartic with quinine, reducing the volume of the blood, and thus in effect the dose is made stronger. The anæmia must not be overlooked, hence iron, or even arsenic, may be indicated.—*Boston Medical and Surgical Journal*, 1893, vol. cxxvii. p. 229.

The Treatment of Malarial Fever by Helianthus Annuus.

Dr. Moncorvo has been investigating this remedy, made from the plant commonly known as the sunflower, which he has used in the form of a tincture of the flowers and leaves, and of other portions of the plant. The Russian peasants, believing in the value of this plant as a febrifuge, have used the leaves for a bed. A physician of that country, Maminoff, has employed the tincture of the leaves in the case of malarial fever. The observations quoted are sixty-one in number, and the ages vary from one month to twelve years. The dose has varied from fifteen drops to two and one-half drachms of the tincture, administered every two hours, four or five times daily. The alcoholic extract, which is preferable, is given in the dose of fifteen to ninety grains. The remedy has been well borne by children, even by the youngest. In the majority of cases the cure has been as prompt as with quinine, and, in those where the treatment has been regularly carried on, there has been no necessity for the use of this alkaloid, and that, too, in conditions of evident gravity. It appears, then, that quinine can be replaced by this remedy, given in the doses above indicated.—*Les Nouveaux Remèdes*, 1893, No. 1, p. 1.

Nasal Insufflation of Sodium Sozoiodol for Whooping-cough.

Dr. Paul Gutmann has used about four grains of this remedy for each insufflation, the nasal cavity having been freed from mucus. The operation was so thoroughly done that the powder appeared at the other nostril. If a severe attack of coughing occurred, so that the powder, mingled with mucus, was expelled, the insufflation was repeated. Thirty cases were under observation. In the six cases from private practice the relief was marked, in between three to six days, as regards the frequency and severity of the attacks of coughing. In the remainder of the cases, those treated in the Poliklinik, there was frequently observed an improvement. The favorable results of the insufflation, into the nose, of various remedies for the relief of this disease

are not infrequent in medical literature, nor is the treatment new, since this method has been employed by Monti, Bachem, Finkler, and Michael.—*Therapeutische Monatshefte*, 1893, Heft 1, S. 15.

The Salicylates in the Treatment of Pleurisy with Effusion.

Dr. George Dock presents a very valuable paper, giving the conclusions based upon the literature and upon his own observations: 1. Salicylic acid and its salts are among the more effectual agents in the treatment of pleurisy with effusion. 2. In effective doses the remedy is harmless, and with proper selection of the preparation, and care in administration, causes little or no discomfort to the patient. 3. Salicylates act most promptly in pleurisies with serous effusion, of recent origin or of long standing, but they are efficient in simple dry pleurisy, and often act favorably in secondary pleurisy. 4. There is no evidence that they are useful in suppurative cases. 5. The drug acts as a diuretic, but may have an effect on the pathological process, or on the cause of the disease. 6. Salicylates have a more marked action in pleurisy than have the diuretics commonly so called. 7. "The duration of the treatment with salicylic preparations is less than with diuretics, common salt, or roborant medication." (Engster.) 8. The remedy can be used at the earliest period, and favorably affects all symptoms. 9. The drug may be given in the form of the acid, or any of its salts, in doses of one drachm of the former, or one or two drachms of a salt daily. In ordinary cases it is not necessary to give the larger doses, and sixty to ninety grains of sodium salicylate, or salol, daily may be considered full beginning doses, to be diminished one-third or one-half after the effect is manifest. 10. The ordinary precautions must be observed in giving the drugs, and during their administration the total amount of urine should be measured daily.—*Therapeutic Gazette*, 1893, No. 2, p. 78.

The Use of Sublimate in the Internal Treatment of Typhoid Fever.

Dr. Loranchet recites the clinical histories of twenty-one cases—but one of which was fatal—seen within a year and a half. The form in which this remedy was used was that of the liquor of Van Swieten. He believes that in all cases the typhoidal infection was considerably attenuated by the sublimate, if not completely arrested. The symptoms remarkably improved, but the remedy was continued until the fever had completely subsided, and for two or three days thereafter. In the relapses it was immediately recommenced. —*Gazette hebd. de Médecine et de Chirurgie*, 1893, No. 7, p. 77.

The Treatment of Pericarditis by the Ice-bag.

Dr. D. B. Lees draws attention to the serious consequences, in damage to the cardiac muscle and the formation of adhesions, which too often result from a pericarditis, after apparent recovery. It is clear that if the local application of ice has any influence in checking the subjacent inflammation, in so far it will tend to relieve the heart from depression, and thus act as a true cardiac tonic. He reports seven cases, which he believes are sufficient to

prove that the ice-bag, when used with reasonable caution, is a safe application in pericarditis; that it is usually liked by the patient; that it tends to check the violence of the local inflammation and to hinder effusion, and that it may even help to cause absorption of effusion which is already present. In view of the extreme importance of preventing, if possible, damage to the structure of the heart, it is believed that the introduction of the ice-bag into the treatment of pericarditis will be found to be a great advance in therapeutics.—*British Medical Journal*, 1893, No. 1677, p. 344.

Acute Mania from Inhaling Carbon Bisulphide.

Dr. Frederick Peterson reports three cases which made perfect recoveries within from two to seventeen months. In none was there any hereditary taint. All were young, healthy, and strong men, working in the same department of a rubber factory where they were exposed to the fumes of a mixture of CS_2 and S_2Cl_2 commonly used in the preparation of rubber goods. In all it was the first attack. The first and third cases were in such a maniacal condition that the subjective and somatic toxic symptoms could not be studied. The second case illustrated some of the peculiarities of bisulphide of carbon poisoning: the headaches, the electric *parœsthesiæ* throughout the body, the sensation of numbness in the tongue and head, the *globus hystericus*, the voracious appetite, the hilarious feeling of early intoxication, the terrible dreams at night, and the general muscular tremor. In none of the cases was neuritis discovered.—*Boston Medical and Surgical Journal*, 1892, p. 325.

The Salol Treatment of Cholera.

Dr. Patrick Hehir used this drug on the supposition that cholera is due to the presence, within the alimentary tract, of the comma bacillus of Koch, that salol prevents the multiplication of this micro-organism, and acts as a germicide upon this specific bacterium. The results of his first cases were satisfactory in the extreme, yet no conclusion could be arrived at because they were too few in number, and occurred at the expiration of the epidemic. His second series were paupers or low-class Hindoos—in fact, the worst possible cases. Ten grains of the drug were given every two hours to each case, with fifteen minims of spirit of chloroform; some patients received small quantities of brandy. The nourishment was iced milk and soda-water, and cold *coujee*. He concludes that salol is of no more value in the treatment of cholera than the many vaunted specifics that have preceded it, and the probability is that, in the epidemic under reference, better results would have been obtained under treatment based upon general principles.—*The Practitioner*, 1892, No. 393, p. 328.

The Treatment of Plaques Muqueuses.

Prof. Fournier believes that the treatment accomplishes a double purpose: 1. It relieves the patient of a troublesome lesion. 2. It destroys at once a formidable germ of contagion. Three facts are well established: 1. Mercury does not cure plaques muqueuses. 2. Cauterization is an heroic method of treatment. 3. It is necessary to add as adjuvant a special hygiene and

some topical application. The caustics in use are nitrate of silver and the acid nitrate of mercury, the latter for extensive lesions. These cauterizations should be repeated two to five times at intervals of four or five days. If the acid nitrate of mercury is used the first time, the nitrate of silver can be used for subsequent applications. For the hygiene: absolutely forbid tobacco and alcohol, demand perfect cleanliness of the mouth, and brushing of the teeth. If there is inflammation, soothing gargles are indicated; later the astringent gargles, as chlorate of potash, borate of soda. If there is much pain, coca leaves or cocaine may be used. Under no circumstances should corrosive sublimate be used, because of its taste and its blackening the teeth.—*La Médecine Moderne*, 1892, No. 57, p. 838.

Salol and Salicylic Acid in the Blood.

Dr. Paul Cornet, from his laboratory investigations, has demonstrated that after the ingestion of salol, the salicylic acid is transformed, before passing into the blood, into an alkaline salicylate, and secondarily that salicylic acid is found in the blood always in the form of an alkaline salicylate. This saline combination takes place not in the blood, but in the intestine, even in case of the ingestion of pure salicylic acid.—*Le Progrès Médical*, 1892, No. 52, p. 515.

Cod-liver Oil Therapy.

An editorial reviewing this interesting question shows that oleum morrhuæ or any animal fat passes rapidly to the lungs—to be quickly and completely oxidized into carbon dioxide and water. And—as biological chemistry has proven beyond a question that the animal economy cannot take a substance composed of carbon, hydrogen, and oxygen, and join to it free nitrogen and sulphur or the nitrates and sulphates, to form a proteid molecule—all that can be derived from the rapid oxidation of the fat is heat, and through it, energy. No constructive or reparative material can be obtained by the ingestion of this or any other fat. In those cases in which there is avoidance of fats of all kinds, and in those others in which further sub-oxidation is necessary to set in motion dormant processes, this oil can be used to good advantage. In all other instances it is as clearly demonstrated that it acts as a positive alterative, by changing decidedly the oxidation processes of the system. But, unfortunately, the alterative effects are in the wrong direction—decreasing the perfection of the proteid oxidation, and often depriving unfortunate patients of the single chance for recovery which they might otherwise have retained. The free ingestion of it rapidly decreases the urea in the urine and increases the incomplete or imperfect products of nitrogenous waste. The more perfectly it is emulsified, the more detrimental it becomes, because thus it is more palatable and is less likely to produce digestive disturbance, and to be, therefore, refused entrance to the system; the emulsion also favors the absorption of an immoderate quantity—thus exhausting the oxygen supply, and rendering the sub-oxidation of the proteid molecule, with all its ill effects, doubly certain. It disturbs digestion and prevents the utilization of other and more valuable forms of food-stuffs.—*Merck's Bulletin*, 1892, No. 11, p. 617.

[It is quite likely that if cod-liver oil is freely administered without due

care and in unselected cases, the general effects would be a predominance of the evil over the good. The same is undoubtedly true of the use of an exclusively proteid diet in patients suffering from chronic wasting diseases, the disastrous results of which are so well known and so frequently met with. The clinical testimony is likely to hold the profession to its use, as against its abandonment on account of theoretical conclusions.—R. W. W.]

The Therapeutic Action of Benzosal in Diabetes.

Dr. Marian Piatkowski has made a careful study of this remedy, otherwise known as benzoyl-guaiacol, reporting eight cases. He concludes that it is a successful remedy in that it diminishes the amount of sugar irrespective of former treatment or the duration of the disease. In some cases the sugar entirely, in others only partly, disappeared. However, it was of more value when administered at the same time that a meat diet was insisted upon, than with a mixed diet. No disagreeable symptoms arose from the drug, which is tasteless and odorless, although the first daily doses of sixty to seventy-five grains frequently gave rise to diarrhœa.—*Wiener klinische Wochenschrift*, 1892, No. 51, S. 730.

The Treatment of Hæmoptysis.

Dr. Fr. Eklund has observed that with each ice-pill which was swallowed, or with each drink of cold milk that was taken, the bleeding increased; large quantities of blood were coughed up. It was clear that the irritation of the ends of the pneumogastric nerve in the mucous membrane must result in paroxysms of coughing, at the same time that the cold produces contraction of the vessels of the stomach, and in consequence a corresponding dilatation of the bloodvessels in the diseased area. Furthermore, intelligent patients fear nothing so much as the drinking of cold liquids, having noted that the coughing up of blood follows the procedure. The feet should be kept warm; washing the mouth and gargling with cold water should be avoided; lukewarm and mucilaginous potions should be substituted for the cold ones. Common salt dissolved in water should be avoided, because its secondary effect is to increase the fragility of the walls of the bloodvessels. An ice-bag over the bleeding-spot is recommended. For drugs, a grain and a half of sulphate of quinine, with three-quarters of a grain of extract of ergot, can be taken from three to six times daily, or a mixture of the fluid extract of cinchona and hamamelis. Lead acetate should be avoided in young persons on account of the danger of poisoning, and in older patients, to be of value, it must be given in large doses and combined with the acetate of morphine.—*Therapeutic Gazette*, 1893, No. 2, p. 83.

Injections of Blood in Pneumonia.

Dr. Fourrière reports a single case of a patient in whom, during an attack of epidemic influenza of a month's duration, a pneumonia supervened. Treatment by means of sinapisms, alcohol, ether, digitalis, inhalations of oxygen, was without beneficial result. On the eighth day two injections of about three drachms of goat's blood were made, which were followed by an

amelioration of the symptoms. Four days after, a second injection was made. Two days later, hypodermatic injections of strychnine were added, and upon the next day an injection of six drachms of blood. Improvement now commenced and continued to complete convalescence. The observations of Bertin and Filleau have shown that these injections have a bactericidal action, and are at the same time powerfully tonic. The blood is withdrawn by an aspirator-needle from the jugular vein.—*Répertoire de Thérapeutique*, 1893, No. 1, p. 24. [The point of injection, the details of technique, and the precautions observed are not stated.—R. W. W.].

The following papers are worthy of notice:

"The Technique of the Subcutaneous and Intra-venous Salt-water Infusion," by DR. VON HACKER, in *Internationale klinische Rundschau*, 1892, No. 50, S. 2025; No. 51, S. 2065; No. 52, S. 2118. A carefully prepared and very complete paper.

"The Treatment of Chloroform-syncope," by Dr. A. A. BOBROFF, *Wiener medizinische Presse*, 1892, No. 52, S. 2065. He regards as irrational: Sprinkling with cold water, alternation of hot and cold compresses, cutaneous friction, tickling the nasal mucous membrane, inhalation of ammonia, rectal application of ice, irritating clysters, bloodletting, blowing air into the mouth or throat, tracheotomy; subcutaneous injection of strychnine, ether, alcohol, ammonia, digitalis; inhalation of nitrite of amyl, acupuncture of the heart and rhythmical compression of the same by the hands. As rational remedies he recommends: Inversion of the patient, auto-transfusion of blood; subcutaneous intra-venous injection of physiological salt solution, electrization of the phrenic, and artificial respiration by the method of Sylvester.

MEDICINE.

UNDER THE CHARGE OF

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PERIPHERAL NEURITIS IN TYPHOID FEVER.

DR. JUDSON BURY, of Manchester, contributes a careful article on this subject to the *Medical Chronicle* (vol. xvi., No. 3). The writer refers in detail to the literature of the subject, and mentions several cases which have come under his observation. The evidence adduced is held to furnish abundant evidence that paralysis involving the whole or a portion of a limb sometimes

occurs either during or subsequent to the pyrexial period of typhoid fever. A case of Gubler's is mentioned, in which there was paresis of the palate (nasal twang) and paralysis of accommodation. A case of George Ross's is also quoted, in which the course and distribution of the paralysis was strikingly suggestive of diphtheria, although that disease could with certainty be excluded.

The following features are usually prominent and throw much light on the situation and nature of the lesion:

"1. The paralysis is usually partial in extent and degree. It may affect the whole of both lower limbs, or one limb, either upper or lower; but, as a rule, it is limited to certain muscles or groups of muscles, and often is strictly confined to the territory of a particular nerve.

"2. The muscles are wasted as well as weak, and when tested with electricity show the partial or complete reaction of degeneration. In a few cases contractures of muscles are mentioned, but it is to be observed that they were found not in a well-nourished, more or less rigid limb, but in one where some at least of the muscles were distinctly atrophied.

"3. The paralysis is almost invariably preceded or accompanied by some form of sensory disturbance. Thus the patient suffers from intense pain, continuous, remittent, fixed, or radiating, or he complains of numbness and tingling in the extremity, which subsequently becomes paralyzed. Anæsthesia, partial or complete, is of frequent occurrence, and, like the paralysis which it usually precedes, may be limited to the territory of a particular nerve.

"4. During the course of typhoid fever, the knee-jerks, as pointed out by Angel Money, are commonly exaggerated, and there may be ankle clonus. Gowers refers to excessive knee-jerk and foot clonus in association with paraplegic weakness in patients seen some months after the fever; and in the case of the man under my own care referred to above, there was exaggeration of the knee-jerks, together with paraplegic weakness and anæsthesia. But, as a rule, judging from the reports in which the reflexes are mentioned, paralysis of the lower limbs is associated with diminution or loss of the knee-jerks."

The atrophic character of the paralysis testifies to a lesion in the lower segment of the motor tract. While probably in some of the cases the paralysis is the result of an anterior poliomyelitis, the presence of sensory disturbance in the vast majority of the cases shows that the lesion, if in the cord at all, is not limited to the anterior horns, or involves both roots or the peripheral nerves.

A consideration of the symptoms observed is strongly in favor of an affection of the peripheral nerves.

The nature of the neuritis—whether accidental or toxic—is briefly considered.

Gowers' theory of local injury—from pressure or stretching of the affected nerve at a time when its nutrition is defective—may be a potent factor in some cases, but in others, according to the writer, evidence is not wanting which tends to show that the neuritis is due to a poison conveyed by means of the blood to the affected nerves, for, even where the chief functional dis-

abilities are limited to one nerve territory, there are frequently slight indications of a more widely distributed disorder.

In addition to the above group of paralyses there are a few observations showing that occasionally an acute paralysis of rapidly ascending course, and frequently terminating fatally, may develop during the course of or immediately after typhoid fever. On the relations of this variety with peripheral neuritis, consult Dr. Ross, *Medical Chronicle*, 1889.

"From a consideration of the preceding observations we are inclined to think that a multiple neuritis, initiated by the virus of typhoid fever, and frequently present in this disease, is not an unreasonable assumption. In one set of cases we may suppose that the action of the poison on the nerves is too slight to give rise to outward manifestations, or that these are masked by the general symptoms of the fever. In another set of cases the toxic influence on the nerves appears to be revealed by a series of irritative phenomena, such as neuralgic pains, cutaneous and muscular hyperæsthesias, exaggerated reflexes, and cramps and contractures of various muscles; while in a third group of cases the presence of an atrophic paralysis, its distribution, progress, and associations leave little doubt on the mind of the observer that he has to deal with a genuine parenchymatous neuritis, and frequently with one of wide distribution throughout the body."

Arsenic in Chorea.

Dr. William Murray, of Newcastle, records in the *Lancet*, 1893, No. 3626, his favorable experience of the treatment of chorea with large doses of Fowler's solution.

The drug is given (to children) in fifteen- or even twenty-drop doses for a few days. This may be done without causing any disturbance of the stomach, provided the medicine be administered *during a meal*. The remedy cannot safely be administered in this fashion for more than a week. The writer states that he has only seen one case resist this treatment in the course of twenty years.

[*Note.*—I have quite recently seen an excellent result obtained in this manner in a case of chorea in a child of five years, which had resisted treatment with smaller doses of arsenic.—W. P.]

Murray also alludes to the good results obtained with large doses of arsenic in the treatment of diabetes, asthma, and atrophic emphysema of the lungs.

Lactic Fermentation in the Bladder.

Sir William Roberts describes the case of a man of eighty-four years who had undergone lithotrity five years previously, and subsequently used the catheter. "The freshly voided urine was very turbid, intensely acid, and contained sugar. Examined under the microscope, it was found loaded with bacteria, in the form of micrococci and bacilli, resembling those which are seen in souring milk. There were also numerous torulæ, having the characteristic appearance of yeast cells. Besides these adventitious organisms there existed a good many pus corpuscles and a corresponding (small) amount of albumin. I had several subsequent opportunities of examining the urine;

on one occasion the sample was withdrawn by catheter in my room and examined in the absolutely fresh state. All the specimens presented the same essential peculiarities. They were all sharply acid and saccharine and contained myriads of bacteria and numerous yeast cells. The patient complained of none of the usual symptoms of diabetes (there was neither thirst nor diuresis); but he reported that some time ago, for a period of three weeks, he suffered from urgent thirst and an excessive flow of urine, and that sugar was then found in the urine by his medical attendant. A remarkable feature of the case, from a clinical point of view, was the maintenance of a sharply acid reaction of the urine and the absence of recurrent formation of phosphatic concretions in the bladder."

The following explanation is suggested:

"In the bladder of this patient three fermentations tending to acidity appeared to be going on concurrently. The chief of these was the lactic fermentation, and lactic acid was identified as the main cause of the intense acidity of the urine. The second was the alcoholic fermentation engendered by the yeast cells, which were always present in the patient's urine. The third was the acetic fermentation, for acetic acid was clearly demonstrated in the distillate from the urine. I failed to obtain direct proof of the presence of alcohol in the urine. The alcoholic fermentation was probably only feeble in degree, and presumably the alcohol generated was usually changed, as fast as produced, by the agency of the acetic ferment into acetic acid. The patient, however, remarked that the urine sometimes had a 'vinous smell,' so that probably the urine did sometimes contain alcohol. There is no difficulty in accounting for the introduction of the germs of these ferments into the bladder in the present case. The catheter which was daily used furnished a well-recognized means of conveyance, and the patient admitted that he was not over-careful in the observance of antiseptic precautions. Finally, it may be confidently predicted that if the patient at some future time ceased to be glycosuric and still went on using the catheter in his careless way the urine would in no long time be in the grip of the ammoniacal fermentation, and he would then stand in danger of the formation of phosphatic concretions in the bladder. His glycosuria, in fact, protects him from this untoward contingency."

The writer suggests that the lactic fermentation might be turned to therapeutic uses—for example, in cases of intractable cystitis from ammoniacal decomposition and in recurrent phosphatic formations after operations for stone. From experiments made in the laboratory, a 10 to 20 per cent. watery solution of "Bynin" (malt extract) would be a suitable one to inject, say twice or thrice daily into the emptied bladder and retained there as long as possible.—*Lancet*, 1893, No. 3626.

Pulmonary Syphilis.

Chomationas (*Revue Méd. de l'Armée*, May, 1892; *Journ. des Mal. Cutan. et Syph.*, 1892, No. 10, p. 563) has reported the case of a man, twenty-seven years old, who, two years after an attack of influenza complicated by bronchitis and followed by hæmoptysis, presented great debility, a Hippocratic countenance, intense dyspnœa, elevation of temperature, insomnia, anorexia,

violent cough, with muco-purulent and blood-streaked expectoration, and profuse night-sweats. On physical examination no lesion was detected at the apices of the lungs, but over the middle lobes posteriorly there were evidences of consolidation and of a small cavity upon the right. The patient presented tegumentary and osseous evidences of a previous syphilitic infection, and on being interrogated admitted having had a chancre ten years previously and having had secondary and tertiary symptoms subsequently. Examination of the sputum failed to disclose the presence of tubercle bacilli. A diagnosis of pulmonary gumma was made, and a mixed treatment with inunctions of mercurial ointment and potassium iodide in increasing doses was prescribed. The patient speedily and progressively improved, symptoms and physical signs receded, and at the end of six weeks the patient was dismissed, practically cured.

In differential diagnosis the following considerations are to be borne in mind: (1) the anatomic localization of the lesions in the lungs, tuberculosis being usually situated at the apices, syphilis in the lower lobes; (2) the microscopic examination of the sputum, the tubercle bacillus being absent in cases of syphilis; (3) the history of the patient, personal and family; and (4) the results of anti-syphilitic treatment.

The Antitoxic Activity of the Blood-serum of Convalescents from Cholera.

Lazarus (*Berliner klin. Wochenschrift*, 1892, Nos. 43 and 44) has made a study of the blood-serum of several cases in which recovery from cholera had taken place, with a view of determining if it possessed any properties by virtue of which it would be capable of protecting other animals from infection with cholera. He found that guinea-pigs that received intra-peritoneal injections of such serum and were subsequently treated with cultures of cholera bacilli were not infected, while control animals unprotected by preliminary treatment succumbed to cholera infection. The smallest quantity sufficient to confer protection upon the animals was 0.0001 grm., representing 1 : 3,000,000 of body-weight. If the protective serum-inoculation was made after inoculation with cholera bacilli, the result varied with the period of time that had elapsed. If the injection was practised at the same time as the inoculation, or before constitutional symptoms, as manifested by elevation of temperature, had appeared, the animal survived; otherwise death ensued. After symptoms of infection had appeared, even the largest doses were not capable of saving the animal.

An Operative Cure of an Enormous Cyst of the Liver.

Boyer (*Prager med. Wochenschr.*, Dec. 28, 1892) reports a rare case of cyst of the liver containing about ten quarts of liquid. The wall of the cyst was made up of altered hepatic substance. There was no trace of echinococcus fragments in the fluid, and no bile-salts or pigment. There was no epithelial lining of the cyst. There was no icterus present either before or after the operation. The swelling made its appearance four months previous to the operation without any subjective symptoms, with the exception of indigestion,

loss of appetite, and irregularity of stools, with alternating costiveness and diarrhœa. The characteristic symptom was a marked pain in the right shoulder. The most probable explanation, to the author, was an inflammatory condition with occlusion of one of the biliary ducts. The absence of icterus and of severe digestive symptoms, with such great changes in the liver, seemed to the author to be of great interest.

A Case of Abscess of the Cavity of Ritzius.

Martin (*Annales des Mal. des Organes Genito-urin.*, January, 1893), from the infrequent occurrence of these abscesses, only forty-three cases having been reported, is led to report the case of a child, sixteen months old, rhachitic, having had digestive troubles, alternating diarrhœa and constipation, having been costive and without stool for some time, and catheterized for four days previous to admission. Just above the pubes was seen a round tumor the size of an egg; it could be distinctly separated from the iliac bones on both sides. The catheterism of the bladder showed it was not the distended bladder. An incision in the median line through the skin and linea alba was followed by the escape of about 3½ ounces of pus. The finger passed down between the bladder and the abdominal parietes. The cavity was washed out with 1 : 4000 sublimate solution, drained, and an antiseptic dressing applied. The patient made a good recovery. The remarkable feature of this case was the extreme youth of the patient, this being the youngest age at which such abscesses have been known, though they are frequent in young children. In the diagnosis, tumors of the wall of the bladder, sacculated bladder, or stone in a sacculated bladder, are easily eliminated by catheterization and the use of sounds. The treatment is that of any abscess cavity.

The Varieties of the Parasites of Malaria and the Nature of Malarial Infection.

Marchiafava and Bignami (*Deutsche medicin. Wochenschr.*, 1892, Nos. 51 and 52) record the results of a study of the parasitology of malarial fever. They come to the conclusion that malaria is an infectious disease caused by a hæmatozoön that does not belong to the order of schizomycetes, but to the protozoa (Laveran). The hæmatozoa appear as amœbæ, which develop within and at the expense of the red corpuscles, converting the hæmoglobin into melanin or rapidly causing a toxic necrosis, whence results anæmia. The amœbæ complete within the red corpuscles a cycle of existence that begins with the motile unpigmented forms (which in the process of development become pigmented) and terminates with the segmentation forms representing the multiplication of the organisms. The newly formed spores give rise to other amœbæ that, in their turn, also invade the red corpuscles. This cycle of life is regularly repeated coincidentally with the periodic recurrence of the paroxysms. Sporulation or segmentation is coincident with the beginning of a paroxysm (Golgi). During this cycle of existence the amœbæ probably give rise to the development of toxic substances, of the existence of which, however, direct evidence is as yet wanting. The evidence leads to

the inference that in the act of reproduction the amœbæ produce a pyrogenic toxine; during their endoglobular development, in the course of fevers of severe grade, they produce toxic substances that possess the property of causing necrosis of the red corpuscles, of separating the hæmoglobin from the protoplasm, and of inducing changes in internal organs. The morphological and biological peculiarities of the parasites differ among the various types or species of fever; whence the existence of several varieties or species of parasites seems reasonable. The differences in the biological and pathogenic peculiarities of the parasites justify the assumption of various types or species of fever. The most recent investigations lead to the acceptance of the following varieties: The amœba of quartan fever (Golgi); the amœba of tertian fever (Golgi); the acemba of summer-autumn tertian; and the amœba of quotidian. The pernicious types of fever are caused only by the last two, and the character of the attack is explicable by the biology of the parasites. The practical outcome of this knowledge is that it thus becomes possible to differentiate at once those cases that may prove pernicious from those that never do. The amœbæ of malaria occasion not only acute alterations of the blood, leading to hypoglobulia, but also changes in the vascular system of all and of the parenchyma of some viscera (spleen, liver, medulla of bone). These anatomico-pathological changes are in some organs but transitory, and largely explain the symptoms attendant upon the acute infection. In other organs (spleen, liver, medulla of bone) the changes are of a more permanent character and suffice to explain the anæmia, the symptoms of chronic infection, and the cachexia.

Two Cases of Diabetes Associated with Atrophy of the Pancreas.

Freyhan (*Berliner klin. Wochenschr.*, xxx. 6, p. 129) has reported from the service of Fürbringer at the Hospital on the Friedrichshain, two cases of diabetes, in both of which, after death, the pancreas was found disorganized in consequence of the presence of calculi in the pancreatic duct. In one case which occurred in a man, thirty-five years old, for half a year there had been occasional pains in the chest, slight cough, general malaise, and loss of strength and flesh. For two weeks there had been increased frequency of micturition. On physical examination the signs of infiltration of the apices of both lungs were found; the sputa contained tubercle bacilli. About two quarts of urine were passed in the twenty-four hours. The secretion had a specific gravity of 1024 and contained three and one-half per cent. of sugar. A careful regulation of the diet was followed by slight improvement, but the course of the case was steadily downward and death took place five weeks after admission to hospital. In addition to the lesions of tuberculosis in the lungs, the pancreas was found atrophied and replaced by a mass of fat. In the axis of the organ could be seen the pancreatic duct, dilated and varicose, literally stuffed with large and small calculi and fine sand.

The second case occurred in a woman who had been ill for four years, and had become reduced in weight to sixty-six pounds. There had been weakness, malaise, and a sense of drawing of the extremities, followed by sharp pains referred to the sacrum and to the extremities. Thirst and hunger became

excessive, and the quantity of urine greatly increased. Later, the appetite failed and emaciation became pronounced. Two quarts of urine of a specific gravity of 1050, containing a trace of albumin and eight per cent. of sugar, were passed in the twenty-four hours. In the course of the disease infiltration of the apex of the right lung took place. The quantity of urine became smaller, while the proportion of albumin increased and the proportion of sugar decreased. After death, in addition to the tuberculous changes in the lung and amyloid changes in the spleen and kidney, it was found that the pancreas was replaced by a mass of fat and fibrous tissue, a few lobules of normal parenchyma yet remaining in the head of the organ. The pancreatic duct was dilated, and contained sand-like material, while near the tail was a large calculus, the outer layer of which was constituted of organic substances, particularly cholesterin, and the inner layer of calcium carbonate.

Brown-Séquard's Paralysis after Influenza.

Eulenberg (*Deutsche medicin. Wochenschr.*, No. 38, 1892, p. 845) has reported the case of a girl, seventen years old, previously in good health, who, following an attack of influenza, attended with considerable elevation of temperature, complained of pain in the back between the shoulders, and of a painful, burning sensation in the right shoulder and in the right arm. In the course of a couple of months, progressive heaviness and weakness were observed in the right lower extremity, which was dragged somewhat in walking. A short time later complete paralysis of the right lower extremity manifested itself, together with paralysis of the rectum and bladder, and complete anæsthesia of the entire left lower extremity. The urine had to be withdrawn by means of a catheter and the bowels moved involuntarily without the consciousness of the patient. Some slight weakness of the right upper extremity was observed, which subsequently became more pronounced. Under treatment the symptoms referable to the bladder and bowel gradually disappeared, while the power of movement in the right lower extremity slowly returned. The right pupil was smaller than the left, the right palpebral fissure was likewise the narrower, and the right side of the face and the right ear felt warmer than the left. The diagnosis of a spinal hemilesion (disease of the right half of the spinal cord) at the level of the lower cervical and upper dorsal nerve-segments was based upon the typical distribution of the palsy, with atrophy, hyperæsthesia, and increased reflexes, in the right lower extremity; the analgesia and hypæsthesia to the middle line in the left lower extremity; the extension of the sensory disturbances to the level of the second or third rib; the atrophic paresis of the right upper extremity; in the distribution of musculo-cutaneous, radial, median, and ulnar nerves with analgesia and hypæsthesia of the posterior aspect of the lower half of the arm, the ulner border of the forearm and hand, and adjacent portions of the dorsal and volar surfaces, including the little finger and the dorsal, volar, and ulnar aspects of the ring finger; and the pupillary and vasomotor thermic differences of the sides of the face. In addition to these features the case presented one other unusual phenomenon: the long extensor muscle of the great toe of the right foot displayed simultaneous faradic and franklinic reactions of degeneration—that is, direct or indirect faradic or franklinic

stimulation of the muscle was followed by slow, deliberate, and prolonged tonic contraction.

Double Aneurism of the Aorta.

Faure-Miller and Cottet (*Bull. de la Soc. Anat. de Paris*, an. lxviii, 5. sér. t. vii., f. 3, p. 75) have reported the case of a man, forty-five years old, who for two months had complained of difficulty in respiration, with frequent cough, the expectorated matters from time to time containing a little blood. The man was anæmic and debilitated. He presented no evidence of antecedent syphilis. On auscultation the respiratory murmur was found to be enfeebled, and there were signs of slight congestion, especially at the apex of the left lung, where the respiration was harsh and the percussion resonance impaired. The results of bacteriological examination of the sputum were negative. The heart was enlarged; its sounds were intensified; but there was neither duplication nor murmur to be detected. In the supra-sternal notch pulsation and slight thrill were appreciable, but there was no difference between the radial pulses. The attacks of hæmoptysis ceased after twelve days, but some four weeks later a paroxysm of marked dyspnœa occurred, with wheezing respiration and coarse, moist râles. There was also aphonia, and on laryngoscopic examination the left vocal band was seen to be paralyzed. There was complaint of a painful sense of heaviness of the left arm. Neither pupil was dilated. Potassium iodide, thirty grains daily, was administered, and some improvement followed; but three weeks later suffocation resulted from a sudden copious hemorrhage. On post-mortem examination an aneurism of the transverse portion of the arch of the aorta was found; and a second aneurism was found involving the posterior wall of the descending aorta on a level with the fifth dorsal vertebra, in which it had formed a hemispherical excavation. The first aneurism was larger than a man's fist and involved the entire superior surface of the arch of the aorta. The tumor had formed adhesions with the sternum. The ascending aorta communicated with it by a large opening, but the opening into the descending aorta was narrowed by the wall of the aneurism. The innominate, the left carotid, and the left subclavian arteries arose from the left portion of the aneurism, to which they were intimately adherent. Upon the left aspect of the aneurism ran the pneumogastric and the left recurrent laryngeal branch. The latter was intricately involved between the inferior surface of the aorta and the left bronchus. The trachea was flattened and displaced to the right. The aneurism had perforated the trachea, and through this opening the fatal hemorrhage had taken place. The aortic leaflets presented no lesion. The left lung was adherent at its base, and at the apex were found several indurated nodules.

Subcutaneous Emphysema in a Case of Diphtheria.

Pineau (*Bull. de la Soc. Anat. de Paris*, an. lxviii., 5. sér. t. vii., f. 5, p. 102) has reported the case of a man, twenty years old, who presented subcutaneous emphysema of the anterior and posterior aspects of the trunk, from the level of the lower jaw to that of the umbilicus in front, and to that of the lumbar region posteriorly, and also of the upper extremities down to

the wrists. There was dulness on percussion at the base of the left lung. The vesicular murmur was feeble. It was learned that two weeks previously, following contact with children who had croup, the man had complained of soreness of the throat. There was some cough, and in the expectorated matters was found false membrane. A particularly violent paroxysm was attended with intense pain in the chest, a sense of oppression, and almost total extinction of voice; and shortly afterward there developed the extensive subcutaneous emphysema. The man died sixteen hours after coming under observation. Upon post-mortem examination larynx, trachea, and bronchial tubes in both lungs were found lined with false membrane. The left pleural cavity contained a pint of serous-fibrinous exudation. The left lung was nowhere adherent. The lower lobe, however, was in a condition of red hepatization. The right lung was adherent to the chest-wall for an extent equal to a silver dollar, at a point corresponding with the supra-mammary region. Upon breaking up the adhesion a rupture of the pulmonary structure was disclosed, and it was in consequence of this that the subcutaneous emphysema had developed. From the pneumonitic area in the left lung, and from the exudate in the bronchial tubes, it was, by culture in various media, possible to demonstrate the presence of the bacilli of Loeffler. Other organisms were also found in the pneumonitic area and in the right lung.

SURGERY.

UNDER THE CHARGE OF

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THE TREATMENT OF GRAVE VESICAL HEMORRHAGE BY SUPRA-PUBIC CYSTOTOMY.

PONCET (*Le Mercredi Médical*, 1892, No. 48) advises supra-pubic cystotomy in certain grave hemorrhages of the bladder, which do not yield to the usual forms of treatment. He prefers to call this operation epicystotomy, on account of its seat, in the anterior wall of the bladder, and also because it is a shorter term. Hemorrhages due to renal or urethral affections, or that due to gonorrhœal cystitis, are, of course, not amenable to this treatment. The cases in which the author advises epicystotomy are hemorrhages due to prostatic disease and to tuberculous affections of the bladder.

Hemorrhage in the prostatic cases may be due either to rupture of a

varicose vein, or it occurs as a complication of a high degree of cystitis. The author cites three cases upon which he operated; one was due to rupture of a vein, and the other two were of the latter class. The result was satisfactory in all.

In tuberculous bladders the repeated hemorrhages present a positive indication for the operation. Poncet refers to two cases of this class which were so much benefited that the subsequent hemorrhages were considered an accident of no gravity.

The author thinks the operation useful in that it enables any clots to be removed which otherwise might become infected, it relieves tenesmus, allows of spontaneous hæmostasis and entire rest to the bladder. In cases of severe cystitis the latter effect is most desirable. Recurrent hemorrhages may be easily dealt with, either by tamponment of the bladder or by the use of the actual cautery. Antisepsis should be practised. The operation is contraindicated in those with a hemorrhagic diathesis.

Prolapse of the Left Kidney, Accompanied with Severe Pain; General Prolapse of the Intestines; Nephrorrhaphy without Freshening; Cure.

Récamier (*Ann. des Mal. des Org. Génito-urin.*, 1892, No. 10) reports the case of a female, aged twenty-three years, who suffered for several years with a very painful wandering kidney on the left side, and also with the symptoms of general enteroptosis.

Nephrorrhaphy was performed without freshening the kidney. The silk sutures were carried through the substance of the kidney. Muscle and skin sutures were then employed. No drainage; healing by first intention. The kidney remained fixed in its normal position, and complete relief from her former symptoms continued at the end of a year.

The Value of Sutures in Cut Throat and Surgical Wounds of the Air-passages.

Henry Morris (*The Lancet*, 1892, vol. ii., No. 26) strongly recommends immediate suture in cases of cut throat and wounds of the air-passages. The author first used sutures on the air-passages in 1888, in a case in which a papilloma had been removed from the larynx. In this case the crico-thyroid membrane, the cricoid cartilage, and the membrane between the cricoid cartilage and first ring of the trachea, were incised vertically, and afterward the wound was completely and accurately closed by chromicized catgut sutures. Since this time he has treated four cases of cut throat in the same manner. The method of operating consists in arresting all hemorrhage, either with ligature or torsion, cleansing the wound thoroughly and then stitching every tissue to its normal position, layer by layer.

Three of the cases made rapid recoveries. The fourth was unmanageable, and after tearing his dressings off the second night after the operation, and tearing the wound open, he died from exhaustion.

In treating these cases by this method, it is essential that the head and neck should be securely fixed during the healing of the wound. The

advantages to be obtained from the use of primary sutures in cases of cut throat, as recommended by Morris, may be summed up as follows: 1. The cut edges of each structure being brought into exact apposition, and so retained by the sutures, union by first intention is secured. 2. This rapidity of union allows of rectal feeding being employed up to the time the patient can swallow naturally. 3. The distress caused by feeding three or four times a day through a tube passed into the pharynx, or œsophagus, is thereby avoided. 4. The prevention of painful or distressing attempts at swallowing, attended by the escape of the fluid at the wound, and the excitement of troublesome spasmodic cough. 5. The prevention of the great risk of contraction or stricture of the air-passage or food-passage so likely to follow when the wounds have been allowed to heal by granulation. 6. The prevention of a temporary or permanent fistula opening into the air- or food-passage. 7. The avoidance of an alleged danger in cases where the epiglottis is cut through—viz., of suffocation from the detached portion of the epiglottis falling over the upper aperture of the larynx.

The Treatment of Large Arterial Venous Nævi by Excision.

O'Neill (*Dublin Journal of Medical Science*, 1893, 3d ser., ccliii.) advises the excision of large nævi, for the following reasons:

1. All the nævoid tissue can be more rapidly and thoroughly removed, so that there is not likely to be a reappearance of the nævus.

2. There is very slight hemorrhage, and it can be easily prevented or arrested by forcipressure forceps and ligatures.

3. There is no slough left in the wound.

4. The wound heals rapidly.

Two cases are cited which were subjected to this treatment. In both, the result was entirely satisfactory.

To control the hemorrhage during operation, hare-lip pins may be passed beneath the growth and a rubber ligature made to encircle the base, or the vessels may be caught with hæmostatic forceps, before being divided; all bleeding-points are to be ligatured.

The Antiseptic Management of Wounds.

In a series of clinical lectures by Sir Joseph Lister, delivered at King's College Hospital, and published in *The Lancet*, 1893, vol. i., Nos. 4, 6, and 7, the author describes the antiseptic technique which he employs in his surgical cases at this time. As his experience has accumulated he has been enabled to simplify very greatly his former methods. Inasmuch as it was known in pre-antiseptic times that wounds so constantly suppurated, and as Pasteur had demonstrated that the air of every inhabited place teems with microbes of various kinds, it was natural to deduct the conclusion that it was essential during an operation to keep the wound bathed in an antiseptic spray during the entire time it was exposed to the air.

It has since been learned, however, that the normal blood-serum is not a very favorable soil for the growth of bacteria, provided they are in an attenuated condition; in addition, the process of phagocytosis will destroy micro-

organisms if not in too large doses. Moreover, the microbes which are habitually in the air are not those which are to be feared in connection with wounds, unless they are introduced in very large quantity. For these reasons irrigation has been dispensed with, attention being given to preventing the entrance into wounds of the grosser forms of septic germs, such as those which exist in impure sponges, dirty instruments, or on imperfectly cleansed skin.

As the best means of purifying sponges, Lister now uses the agent which he first employed, namely, carbolic acid. The change from carbolic acid to corrosive sublimate, which was made later, was due to the publications of Koch, in which the superiority of corrosive sublimate as a germicide seemed to be satisfactorily proven. In its practical application to surgery, however, it has not borne out the conclusions reached in the laboratory. While it is true that under favorable conditions corrosive sublimate is more destructive to resisting spores than carbolic acid, still the most resisting spores are not those which the surgeon has to fear. The microbic enemies of surgery are almost entirely sporeless micrococci. It has been shown by Behring that carbolic acid of the strength in which it is used in surgery is more destructive to the staphylococcus pyogenes aureus, which is a very common cause of suppuration, than is corrosive sublimate. Inoculation experiments by Professor Crookshank, undertaken at the request of Lister, has demonstrated the fact that carbolic acid 1 : 20 will effectually destroy tubercle bacilli.

Professor Lister now purifies his sponges as follows: They are washed first with soap and water and afterward with soda, then thoroughly rinsed with water, and after drying are placed in carbolic solution 1 : 20, until again required for use. The instruments are placed in a 1 : 20 carbolic solution before being used, and the same solution is used for purifying the skin of the patient and the hands of the operator. The length of time necessary for the instruments to remain in the solution will depend upon the care with which they have been cleansed after last using. As a general rule, the length of time required for anæsthesia is a sufficient period for the immersion. The preparation of the field of operation may be postponed until anæsthesia is begun, when a few minutes' action of the 1 : 20 carbolic solution will render the parts sufficiently sterile. Carbolic acid is preferable to corrosive sublimate because it has a powerful affinity for the skin, penetrating deeply into its pores and mingling with fatty materials in any proportion. Corrosive sublimate does not possess this property in any degree.

During the operation the sponges are washed in 1 : 40 carbolic solution; the field of operation should be surrounded with towels wrung out of some trustworthy antiseptic solution, and the nurses and assistants should be carefully trained to avoid contact with any gross septic material. At the conclusion of the operation the wound may be gently washed with a 1 : 40 carbolic solution.

In the second lecture the following directions are given for those cases in which an operation may be called for, and no chemical antiseptic is at hand. The sponges, the silk threads, ligatures, and such instruments as will not be injured, should be well boiled; towels dipped in boiling water and spread about the seat of operation will diminish the chances of contamination of the wound from surrounding objects. Then thorough cleanliness in the ordinary

sense, by free use of soap and water for the hands of the surgeon and assistants, as well as the field of operation; the suture material may be either silver wire, silkworm-gut, or horsehair, which should also be boiled. For dressing wounds made under these conditions dry substances, such as absorbent cotton, wool, or lint, are far better than anything kept permanently moist.

Iodoform is considered to have a powerfully antiseptic influence on wounds, probably by inducing chemical changes in the toxic products of bacteria. In operation wounds in situations where it is impossible to exclude septic agencies, as those about the mouth or the rectum, the cut surfaces should be mopped with a solution of zinc chloride, forty grains to the ounce, and then dusted with iodoform. In compound fractures the author strongly advocates the use of iodoform. In operations when the integument is unbroken, however, with a sufficient space around for the dressing, its use is not recommended. It need not be applied to the interior of wounds under these conditions.

An external antiseptic dressing, to be ideally perfect, should have these qualities: 1. It should contain some thoroughly trustworthy antiseptic ingredient. 2. It should have that substance so stored up that it cannot be dissipated to a dangerous degree before the dressing is changed. 3. It should be entirely unirritating. 4. It should be capable of freely absorbing any blood or serum that may ooze from the wound.

After discussing the merits of carbolic acid, corrosive sublimate, and serosublimate gauze, Lister asserts that the most satisfactory antiseptic substance for the dressing is the double cyanide of mercury and zinc. This salt is but slightly soluble and, therefore, is permanent in the dressing; it is unirritating and amply competent to prevent germicidal development. Further, cyanide of mercury is far superior to the bichloride in inhibitory power. Before applying the double cyanide gauze it should be dipped in 1 : 20 carbolic solution. The usefulness of the gauze is impaired and made more irritating by dipping in bichloride solution even as weak as 1 : 4000. The bandages which are used immediately over the dressing may be prepared in the same manner as the gauze. When a free discharge is anticipated, a piece of thin mackintosh may be applied over the exterior of the dressing. In changing the dressings, 1 : 40 carbolic is the antiseptic employed. If the discharge is free the dressing may be removed in twenty-four hours, in other cases it may be delayed for some days.

The Successive Ligation of Four Large Arteries in the Treatment of Aneurisms.

Mackellar reports in a clinical lecture (*The Lancet*, December 3, 1892), a case of successful ligation of both femoral arteries for popliteal aneurisms, a period of one year intervening; three years later the patient returned with a pulsating tumor behind and above the manubrium sterni; for this the right common carotid and the third part of the right subclavian arteries were simultaneously ligatured. The patient died three months later of hemorrhage. The autopsy gave the following instructive points. The silk used in ligating the arteries was boiled in bichloride of mercury solution. The usefulness of certain knots is well illustrated in the conditions found. In the right superficial femoral, tied with a surgeon's knot, the walls of the vessel were not in

contact, but the lumen was occluded for three-fourths of an inch, except that a bristle could be passed. The aneurism was converted into a fibrous mass. No trace of the ligature could be seen. The vessel was patent from the ligature to the aneurism. In the left popliteal the conditions were the same, excepting where the ligature, a "stay knot," had apparently occluded the vessel more thoroughly without injuring the coats. In all the cases the seat of ligature was enveloped in a small fusiform mass of connective tissue. In the right common carotid the coats were uninjured, the walls in contact, and the lumen above and below filled with clot; the ligatures were encapsulated in connective tissue. The third part of the subclavian ruptured in ligating, and was divided and ligated at both ends; the ends, separated by half an inch, lay in a connective-tissue mass. On the proximal side there was no clot whatever, although the inner coat was ruptured and recurved, and though the nearest branch was distant an inch and one-quarter. On the distal side the clot extended to the nearest branch—that is, for half an inch. The ligatures ulcerated through the vessel and lay in minute inflammatory cavities. The aneurism was one of the arch, sacculated, a portion extending upward in front of the innominate artery. The efficacy of treatment of these aneurisms by distal ligature is doubtful, but apparently gives temporary relief.

Irreducible Ischio-pubic Dislocation of the Head of the Femur.

Tillaux (*Rev. d'Orthopédie*, January, 1893) reports a case of irreducible dislocation of the femur; the head was found beneath the adductors, and the case was presented eight weeks after the accident. The position in bed was one of flexion, abduction, and rotation outward. After failure under anæsthesia to reduce, an incision was made over the head of the femur which was found to be bound firmly in place; it was resected, and the neck came easily into the cotyloid cavity. Recovery was uninterrupted, extension in bed being continued for one month. Patient was dismissed in good condition; rotation normal; flexion to a right angle with the pelvis was possible; abduction and adduction normal; movements voluntary and forcible; walking with a cane was easy, but could move readily without it; the only deformity on inspection was a slight flatness on the affected side.

The Treatment of Penetrating Wounds of the Abdomen.

Lühe (*Deut. militärärztl. Zeitschr.*, 1892, Hefte 4–7) is reported (*Centralbl. für Chir.*, December 17, 1892) as concluding from 324 cases which he collected and tabulated, including those of McCormac, Coley, and Morton, that in cases of undoubted perforation, laparotomy is indicated, but he does not recommend the diagnostic method of Senn, by the use of gas. The percentage of deaths in this series of cases, excluding vesical wounds, was 64. The mortality in 152 cases of shot wounds was 62.9 per cent., while for other forms of wounds it was 34 per cent. In those cases in which laparotomy was performed within the first twelve hours, the mortality was 58 2 per cent.; but in those cases in which it was delayed for a longer period, the mortality reached 79.5 per cent.; while the mortality in those cases in which the length of time was unknown was 52 4 per cent.

This shows that delay increases the mortality in operations after these wounds. The rule that immediate laparotomy is necessary must of course have some exceptions, as in military practice, where antiseptic precautions and the time necessary for the proper performance of the operation are wanting.

He believes the formation of artificial ani will be often necessary. He recommends the ordinary methods of hæmostasis and suture; the washing out of the abdominal cavity with salt solution in cases where there is urinary infection; drainage, especially the iodoform gauze drainage of Mikulicz. Transportation should be prohibited during the first few days at least.

The Treatment of Epithelioma of the Lip by Excision so as to Prevent Reappearance.

O'Neill (*Dublin Medical Journal of Medical Science*, 3d ser., 1893, No. 253) details the histories of three patients upon whom he operated for epithelioma of the upper lip.

The method adopted is, first to remove the lymphatic glands if they are enlarged. If the submaxillary gland is involved this is to be removed also. In such cases it is necessary to ligature the facial artery in two places and cut between; the epitheliomatous ulcer is next to be excised, the whole thickness of the lip being removed, and at least half an inch of healthy tissue from each side of the ulcer. The removal of the affected glands is considered of equal importance to the removal of the primary lesion.

The patients were seen one, four, and two years' respectively, after operation, and there was no sign of reappearance of the epithelioma.

Intestinal Occlusion by a Gall-stone; Laparotomy; Enterotomy; Recovery.

Pouzet (*Arch. Prov. de Chir.* t. ix, p. 184) is quoted as reporting (*Centralbl. für Chir.*, December 17, 1892) a successful laparotomy with uninterrupted recovery, after the removal of a gall-stone weighing twelve grammes (180 grs.). The operation was performed six days after the symptoms first appeared; the patient was a woman seventy-five years of age. According to Baudouin's table there have been only twenty-one operations performed for this complication, with but six recoveries.

Cystocele in Inguinal Kelotomy.

Bourbon (*Thèse de Paris*, G. Steinheil, 1892) is quoted (*Centralbl. für Chir.*, December 31, 1892) as basing upon sixteen cases collected and the two he reports, the theory that many of these complications owe their origin to the presence of lipomata on the wall of the bladder, and their connection with fatty masses that lie in a congenitally-formed hernial sac, bound to the abdominal wall by strong fibrous bands, while in the neighborhood are serous cysts, such as accompany congenital hydroceles. Such cystoceles appear as small, irreducible, painful tumors, situated in the middle of the hernial canal. As they are always formed by the extra-peritoneal portion of the bladder, they possess no peritoneal covering. More frequently these cysto-

celes are found accompanying large, long-standing enteroceles, and are brought down by the tension exerted upon the bladder by adhesions, through a widely distended internal ring. The theory of the author was not supported by the cases he reports, one being but briefly described, while the other was operated upon for a strangulated entercocele in connection with which was found a large cystocele covered by peritoneum. The relief of the constriction allowed the reposition of the parts, and it was then found that the extraperitoneal portion of the bladder had been drawn to, but not into, the internal abdominal ring. The canal was sewn up. The patient recovered.

The difficulty of diagnosis which often accompanies these conditions leads the author to suggest that the artificial emptying and filling of the bladder will often prove of great service. In the majority of cases the condition is not known until the operation, and in the thirteen cases previously reported the bladder was incised in nine before the true condition was realized. The complications he mentions are stone-formation in the prolapsed portion, which in one case ulcerated through the skin, producing a vesical fistula and strangulation, which was accompanied by the ordinary symptoms, and in addition hydronephrosis, cystitis, and pyelitis. A diagnosis of cystocele calls for immediate operation, and only the more urgent contra-indications should prevent it. Wounds of the bladder-wall should be sutured, though the author considers it preferable to drain through the wound in cases of aggravated cystitis.

Epithelioma of Transverse Colon; Resection; Recovery.

Reverdin (*Arch. Prov. de Chir.*, January, 1893) reports a very interesting case of resection of the transverse colon for epithelioma, with the establishment of an artificial anus, followed by recovery.

The patient, a woman fifty-eight years old, consulted the author on account of intense, persistent pain in the abdomen. Examination showed the abdomen to be swollen, dark in color, and œdematous. It was impossible to diagnosticate the condition present, and not until the operation, after the evacuation of a large quantity of pus, was the diagnosis made. The large amount of colon involved made an enterorrhaphy impossible. The distal end of the colon was, therefore, invaginated and sutured, while the proximal end formed an artificial anus just above the umbilicus. The tumor was a cylindrical epithelioma, nine inches in length, completely preventing the passage of solid fecal matter; it involved all the coats of the intestine, but there were no evidences of further spread of the disease, and no lymphatic involvement. The patient left the hospital on the twentieth day in good condition, and was heard from four months afterward, having gained in health and weight. The author remarks on the mildness of her symptoms, and the apparent tolerance of the system under such circumstances, the colon being loaded with a great mass of feces.

A New Method of Purifying Water.

Schipiloff (*Rev. Méd. de la Suisse Romande*, December 20, 1892) describes a new method for the purification of water, which is called and is an oxidation of all organic material by the permanganate of potash or soda. It

removes at the same time living organisms, microbes, or others, and all soluble organic material. The power of the permanganate is indisputable; it is admitted to be fifty times as powerful as carbolic acid in destroying bacteria in cultures. It is, however, necessary, in order to certainly destroy all organisms, that there should be an excess of permanganate in solution, as shown by a faint purple color. It is not possible, however, to drink with impunity this excess, and this must be eliminated. Taking advantage of its great oxidizing power the author eliminates it by the addition of a little sugar, whiskey, brandy, or wine; the purple color disappears or changes to a yellow-brown, caused by the formation of the innocuous binoxide of manganese, which can be allowed to settle or be filtered or even drunk with impunity. This is, however, an expensive method for preparing large quantities of water; animal charcoal or even ordinary charcoal may be substituted; this latter should be finely powdered in a mortar and added to the water after the permanganate, and then filtered through two thicknesses of cloth.

Great care should be exercised in keeping the mortar clean and pure, as the permanganate will not destroy the organic substances that may be contained in the charcoal. The charcoal can be used a number of times, and should be dried or heated after use. The cost of this method is very slight, one pound of permanganate sufficing for about 10,000 gallons of ordinary river water, while the most stagnant water can be made absolutely pure. In experiments, the author has rendered extremely toxic solutions of curare, strychnine, veratrine, and morphine absolutely harmless.

Surgical Intervention in Tumors of the Dura Mater.

Delagénière (*Arch. de Chir.*, February, 1893) reports a case of angiolithic sarcoma of the dura mater in which, after trephining, extirpation of the tumor, with resection of the dura mater, the patient made a good recovery. He draws the following conclusions from his study of the case: 1. Perforating tumors of the cranium, whatever their nature, have a special form of development. 2. In the majority of cases they originate upon the external surface of the dura, dissect it from the bone, perforate the bone, raise the integument, and finish by perforating it. 3. Anatomically they may be considered as pedunculated, having a base internal, a neck corresponding to the opening in the skull, and a subtegumentary intra-cranial portion. 4. Surgically, they are pediculated tumors originating from the dura, and the removal of that portion of dura and the tumor guarantees their total enucleation. 5. To remove them it is necessary to remove the external portion and sufficient bone to uncover the entire base; they should then be removed by "morcellement" (in fragments) and finally the dura resected, the entire portion upon which the tumor rested being removed. 6. This method was entirely successful in the case reported.

The Cause of Death after Burns.

Salvioli (*Centralbl. für Chir.*, January 28, 1893) claims that his experiments on mammalians, as described (*Virchow's Arch.*, Bd. cxxv.), prove that death after severe burns is caused, or at least partially caused, by the closure of large arteries by thrombi. The microscopical examination of the mesentery

after the application of heat, between 120° and 130° F., shows a collection of the blood plaques and white corpuscles on the inner side of the arterial walls, and the formation in this manner of thrombi, which are carried into the circulation, as is evidenced by the numerous hemorrhagic infarcts in the parenchyma of the lung, and the numerous thrombi in the arteries after death. The slowing of the circulation is partly due to the thrombi and embolia, and partly to a narrowing of the arteries, caused by the clinging together of the red blood-corpuscles, which hinders the circulation. He thinks the belief that the blood plaques increase in number is an error. All the symptoms depending on the blood after burns are caused by the presence of the blood plaques. This he proved by reducing by defibrination the number of white corpuscles in a dog, from the proportion of 1 : 35 to 1 : 720. In these animals burning of the mesentery did not produce the same results, showing that the reduction of white corpuscles prevented the changes, and that they were due to the presence of the blood plaques in the blood.

The Surgery of the Gall-bladder.

Lauenstein (*Centralbl. für Chir.*, January 7, 1893) in speaking of the difficulties encountered in draining shrunken gall-bladders after operation, commends highly the procedure recommended by Riedel, the use of a portion of parietal peritoneum in connection with or without the fascia transversalis, thus forming a canal for the drainage of pus and bile outward. He has found it useful in his cases, but in certain cases it is not sufficient, and in these he recommends the great omentum, as an easily obtainable and sufficient plastic material. It should be drawn up and its free border sutured to the bladder opening, and then used to connect it with the abdominal incision. In one case he made the entire canal of the omentum; in another, he combined it with the Riedel method; in both good results were obtained.

A Case of Cerebral Injury, with Loss of Substance; Complete Recovery.

Popper (*Centralblt. für Chir.*, February 11, 1893) reports the following case:

A girl, aged fourteen years, was kicked in the head by a horse, sustaining a depressed fracture of the left parietal bone, two by one and three-fourths inches in extent; the internal table was not so extensively injured. One side remained in position, the other three were depressed into the brain. Pulsation was absent. The position of the fragment over the longitudinal and transverse sinus, made the difficulty of elevation greater. A portion of the uninjured bone had to be removed, and when the depressed fragment was raised there was free bleeding from the sinuses; this was controlled by tampons of gauze, pushed under by the elevator and by digital compression on either side. The brain still pulsated; it was wounded to a depth of one-half to three-quarters of an inch. The wound was dried with carbolized gauze, no further antiseptic being used. After the splinters of bone were removed, the provisional tampons were replaced by layers of iodoform gauze, then the fragment of bone and further tampons of gauze, the whole being covered by

an antiseptic bandage. After the operation the patient was pale, the pulse frequent; three injections of ether produced good results. On the fifth day the tampons were partially and on the seventh entirely removed, without loss of blood. There was loss of speech for seventeen days. The patient was seen, completely cured, fourteen days previous to the report. The wound of the soft parts was entirely closed by scar tissue; there was no derangement of function or epileptic symptoms present. Continuous bending over, or long journeys, produced faintness, but there was no mental disturbance. That there is still time for the appearance of unpleasant symptoms the author does not deny, but thinks the speedy return of speech, unaccompanied by any paralytic symptoms, is noteworthy in a wound so situated, endangering the centres of both upper and lower extremities.

Osteoplastic Operation for Necrosis.

Lücke (*Centralbl. für Chir.*, December 3, 1892) refers to an operation devised by him in 1888, claiming for it originality and precedence to that of C. Wagner. He describes the operation briefly as follows:

A linear incision is made extending over the space which the operation is intended to cover, through skin and intervening structures, and including the periosteum. An incision is then made with a chisel in the bone corresponding with this linear incision; then transverse incisions of the necessary lengths are made, in like manner, at either end of this linear incision, and the entire skin-periosteal-bone flap is raised and turned back. At the point opposite the cloaca a wedge-shaped bone-periosteal flap is raised from its longer side, and so placed as to fill the space where there has been loss of bone. By a subcutaneous operation over the base line of the flap, it may be cut slightly with a chisel, and this is found to assist and facilitate its removal. In the cases in which this method has been tried, the author has found it to hasten healing. It is more applicable to the diaphysis than to the epiphysis of bones.

The Tamponing of the Bladder after Supra-pubic Cystotomy.

Desnos (*Ann. des Mal. des Org. Genito-urin.*, January, 1893), after reporting three cases of supra-pubic cystotomy, in which the treatment of a tubercular ulcer in one case and profuse hemorrhage in the two others required the use of this measure, admits that the method is only applicable to a few cases; those especially adapted to this form of treatment being tubercular cular ulcerations, while it is a very serviceable stand-by in cases of rebellious hemorrhage. The tamponing is made effectual in the following manner: Two threads are passed through the sides of the wound, including the vesical mucous membrane, which afford an easy means of holding open the wound and distending the bladder. A siphon-tube of the Guyon-Perier pattern is then placed so that it reaches but does not press upon the floor of the bladder. Iodoform gauze in tuberculous cases, carbolized in others, covered with iodoform or other ointment, is then laid on the floor of the bladder, forming a passage from the ureters for the urine to the drainage-tube. The rest of the cavity is then carefully filled with layers of gauze, care being

taken to lay them in order and in such a manner that they can be easily removed. The ends of the wound may be then partly closed, but a large wound is preferable. It will be found that drainage is complete and that the tampons will not become wet with urine. It is, however, impossible to renew the tampon except under ether, but it can with safety be allowed to remain for from four to six days. Care should, however, be taken if iodoform be used, as symptoms of poisoning are liable to follow its free use in an irritated and inflamed bladder cavity. The tampon is well borne; there is neither pain nor imperative desire to urinate, and if it is well applied there will be no soaking with urine.

DERMATOLOGY.

UNDER THE CHARGE OF

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Syphilitic Myxœdema.

Dr. R. Köhler (*Berl. klin. Wochenschr.*, 1892, No. 30) reports a case of undoubted myxœdema atrophicum occurring in a woman forty-eight years of age, with enlargement of the thyroid gland which had existed from early life. One year before coming under observation she had general symptoms which were suspicious of syphilis, but this diagnosis could not be established. She was placed upon iodide of potassium, with the result of curing her, so that at the date of reporting the case a diagnosis of myxœdema could not have been made. The author asks if the disease could have been of the nature of an interstitial syphilitic deposit.

Europhen as a Local Dressing.

Prof. O. Petersen (*St. Petersburger medicin. Wochenschr.*, 1892, No. 14) considers the publications of Eichof, Sichel, Lowenstein, and others, on this remedy, and gives his own views cautiously as to its value, coming to the conclusion that in minor surgery and in the treatment of chancroid, europhen is to be preferred to iodoform.

The Penetration of Ointments.

Aubert, of Lyons, the well-known physiologist and clinician (*Journ. of Cutan. and Gen.-urin. Dis.*, Dec., 1892), has studied the penetrating properties of ointments through the skin. The experiments consisted in incorporating atropine with the various substances, and then, causing the subjects to exercise, collecting and examining the sweat. When the application was made by simple inunction, oils and lard penetrate best, while vaseline, cerate, and lanolin penetrate scarcely at all. When the application is made, however,

with the aid of brisk rubbing, it was found that lanolin did best, because, by reason of its stickiness, friction always produced some erosions, or caused some hairs to be pulled out, thus favoring absorption.

Post-vaccinal Eruptions.

Paul Schimmelpfennig (*Archiv für Derm. u. Syph.*, 1892, Heft 4) considers that eruptions of this nature may be called forth by an irritation to the vasomotor system, occasioned by foreign substances in the blood-vaccine lymph derived from absorption of the pustule. Of these may be mentioned general measly eruptions of short duration and without systemic disturbance, urticarial eruptions, erythema multiforme, and pemphigus, which latter, however, in some cases must be regarded in the light of a secondary infection.

In a second list may be classed certain latent diseases, which may be provoked by vaccination, as hereditary syphilis, eczema, and prurigo. Thirdly, eruptions may be due directly to infection caused by inoculation, as syphilis, erysipelas, and impetigo contagiosa.

The Blood Elements in Syphilis.

Kouried, of Vienna (*Journ. of Cutan. and Gen.-urin. Dis.*, Dec., 1892), is of the opinion that previous works on blood-changes in syphilis lack scientific basis.

Examinations have recently been made of the blood in the first stage of the disease, in the secondary period, during the course of treatment and in untreated subjects. The proportion of hæmoglobin, one of the principal elements of the blood, is of great importance. From the very beginning of the disease, from the third to the seventh week, it is found diminished in the proportion of 20 per cent. Under the influence of treatment the proportion of hæmoglobin increases, but very slowly regains its normal color. In some cases of mild syphilis, untreated, the hæmoglobin acted in the same manner, the proportions increasing with the disappearance of the florid symptoms. In tertiary syphilis symptoms of grave alteration in the blood are noted. While the number of leucocytes is so variable that no defined conclusion can be drawn, the morphological changes are very noticeable. We may conclude from the observations that syphilis is a disease of the blood, and thus the marked anæmia often caused by the disease may be explained. Syphilis should be kept in mind as a possible etiological factor in such diseases as pernicious anæmia and tabes dorsalis.

Pemphigus Puerperalis et Neonatorum.

Dr. Staub, of Posen (*Annales de Derm. et de Syph.*, Nov., 1892), believes that this variety of the disease results most frequently from intra-puerperal infection. He cites a case of grave puerperal fever, complicated with pemphigus, the infant also being attacked with pemphigus of the newborn type. Both recovered. In two other cases the infants succumbed in the course of the eruption, but the mothers recovered. The cause of the uterine infection is often to be attributed to midwives.

Psorosperms in Cancer.

Török, of Budapest (*Annales de Derm. et de Syph.*, Nov., 1892), from his researches, arrives at the conclusion that the cellular bodies which have been described as the parasites of cancer are nothing more than nuclei of the epithelial cells, migratory cells, or blood corpuscles in a state of degeneration.

Leprophobia.

Dr. A. Lutz, now of San Francisco, who has had much experience with leprosy (*Journ. of Cutan. and Gen.-urin. Dis.*, Dec., 1892), warns against this condition of mind to which some persons are prone, and regards it as an act of humanity to combat all unproved and exaggerated statements, bearing in mind that the heredity of the disease is not proved; that the danger of passing intercourse with lepers is exceedingly slight; that contagion even by intimate and prolonged contact is by no means frequent in families living in a civilized way.

Pemphigus.

Dr. Petrini, of Bucharest (*Annales de Derm. et de Syph.*, Nov., 1892), distinguishes three kinds of pemphigus: common chronic; foliaceous, primary or secondary; and vegetating. He has studied three cases resulting in death after six, twelve, and eighteen months. Twice he found some alterations in the posterior roots of the spinal cord; twice fatty degeneration of the liver was found; and in all the cases alterations of the peripheral nerves and lesions of the spinal ganglia were noted.

Lupus Erythematosus.

Malcolm Morris (*Journ. of Cutan. and Gen.-urin. Dis.*, Dec., 1892) believes that this disease is of an inflammatory nature, belonging to the erythemata, and having no relation to any specific micro-organism. It depends primarily on disturbance of the local circulation brought about by heat or cold, or by nervous influences. The term lupus is regarded as inappropriate, and "atrophying erythema" is suggested as a better name. Two forms of the disease are recognized, the discoid and the aggregated, which is in accordance with the division of Kaposi. He believes that those cases where lupus erythematosus are said to be transformed into lupus vulgaris are really examples of lupus vulgaris erythematoides.

Dermatitis Herpetiformis.

Stephen Mackenzie, of London (*Brit. Journ. of Derm.*, Jan., 1893), gives a lengthy, practical paper on this disease, illustrated with twelve cases, bringing out its polymorphic character, chronicity, and relapsing course. The vesicular and bullous varieties were the most common. In nearly all there was at some time more or less grouping on the herpetic pattern.

To secure rest at night, chloral and opium were both found useful. During the daytime, cannabis indica, from ten to twenty minims of the tincture thrice

daily, gave the best results. Antipyrine, in from twenty to thirty grains, best given in the evening, or at bedtime. Arsenic appeared to be curative in a few cases, controlled the disease to some extent in some cases, and failed altogether in others. Usually full and increasing doses to the point of toleration were given. Quinine occasionally appeared to be of service. No special form of local treatment is recommended, though the author believes that the method first described by Duhring (consisting of inunctions with strong sulphur ointment) is worthy of a trial.

Lepra and its Bacillus.

Drs. Delépine and Slater (*Brit. Journ. of Derm*, Jan., 1893), in a case of this disease, examined all the tissues of the body for bacilli. All attempts to demonstrate the bacillus lepræ in lymph, blood, or pus obtained during life were unsuccessful. Dealing with the lung lesions they quote numerous observers, of whom the majority are opposed to the existence of a true leprotic phthisis. The authors are of the opinion that *there is no method of distinguishing the bacilli of tuberculosis and leprosy by their staining reactions.* As to the distribution of the bacilli in the various organs, they occur in the skin (uniformly), in the mucous membranes of the mouth, pharynx, and larynx, in certain nerves, and in certain lymphatic glands, in bones, and in the liver, but are absent in the kidneys, supra-renals, thyroid, and the mucous membrane of the stomach, small intestine, and bladder. Of the various tissues, they are most abundant in areolar connective tissue, and then in lymphoid tissue. In epithelium they are rare, and in cartilage are absent.

Tinea Favosa contracted from Animals.

Dr. S. Sherwell (*Amer. Veterin. Review*, Nov., 1892) reports some interesting cases of this disease communicated from mice. In one instance four members of one family were affected, having evidently been infected from pet dogs, one of which had previously been found playing with a sick mouse, which, from the description, had favus. Some of the mice were caught and the parasite was demonstrated. Instances of ringworm contagion from kittens are also recorded.

Four Cases of Cheilitis Glandularis.

H. S. Purdon, of Belfast (*Brit. Journ. of Derm.*, Jan., 1893), who states that this rare disease was first described by Professor Volkmann, of Halle, reports four cases observed during the past twenty years. Three were in males, the other in a young lady aged twenty-three years, who was under his observation for three years, the disease being confined to the lower lip and its mucous lining. The lips were glued together in the morning; with exacerbations the lip became swollen, firm, or hard, with little or no pain. The eye could distinguish the mucous glands swollen and pouring out a muco-purulent secretion through the dilated ducts. The disease extended to the lining membrane of the cheeks and gums. Black wash with glycerin and the occasional use of nitrate of silver locally gave the best results. Arsenic and other internal remedies were of no benefit.

The Pigmentary Syphilide.

Dr. R. W. Taylor (*New York Med. Journ.*, Feb. 18, 1893) contributes a carefully studied paper on this affection (with photographs and colored plates), stating that the primordial pigmentary anomalies due to syphilis consist essentially in a superpigmentation, which may in whole or in part be replaced by a corresponding loss of color or leucodermatous condition. This primordial hyperpigmentation is the essential pigmentary syphilide; all other discolorations are secondary processes, and in no manner entitled to be classed as pigmentary syphilides.

The affection occurs in three well-marked and quite distinct forms:

1. As spots or patches of various sizes.

2. As a diffuse pigmentation of greater or less intensity, which, sooner or later, becomes the seat of whitish spots, which gradually increase in size, constituting a retiform variety.

3. As an abnormal distribution of the pigment of the skin, in which some spots become lighter and others darker, in this manner a dappled or marbled appearance resulting—the marmoraceous variety.

The Action of Thiosinamine (Allylsulphocarbamide).

Hans von Hebra, of Vienna (*Brit. Journ. of Derm.*, vol. iv., No. 10), has experimented with this drug, and makes a preliminary report. Thiosinamine is obtained from the volatile oil of mustard, and is a crystalline chemical product of constant composition, which, when subcutaneously administered, produces a local reaction without any general disturbance of the system. It exerts a favorable influence over lupous tissue, and renders cicatricial tissues soft and pliable. It has a specific action in diminishing glandular swelling. It favors the absorption of the products of exudation.

OPHTHALMOLOGY.

UNDER THE CHARGE OF

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Myopia the Result of Constitutional Disease.

Dr. R. D. Batten (*Ophthalmic Review*, vol. xi., No. 123), taking up the comparison of myopia to rickets, urges that while the deformity and mechanical conditions that determine it and the local disturbances attending it have been carefully and minutely studied, the underlying constitutional conditions

that constitute the true causes of myopia have not received the study that has been accorded to the general nutritive changes of rickets. The dilatation of the eyeball is also like dilatation of the heart, in that it may be due to disease or strain, or to both acting together, and in that serious disease may not cause impaired function.

The constitutional condition which he believes underlies myopia is one which might reasonably be termed "vascular rickets," as it appears to depend on a yielding of the vascular and ocular walls. It might be defined as a disease chiefly of city life, the result of faulty nutrition, developing during the period of youth and growth, and producing deformities of the eye and cardio-vascular system.

In support of his view he presents observations of the association of the following conditions with myopia:

1. Spontaneous hemorrhages (epistaxis, menorrhagia, retinal hemorrhages).
2. Capillary congestion.
3. Cardio-vascular disease (high arterial tension, cardiac hypertrophy, valvular disease).

The cardio-vascular condition is regarded as a form of high arterial tension or the result of it. The pulse is large, full, rather slow, but within normal limits. The arterial walls feel thin, the tension is full, and often distinctly high. The pulse is distinctly recurrent. The heart shows signs of enlargement of very variable degrees, and this is probably due to both dilatation and hypertrophy. There is generally some alteration in the rhythm and accentuation of the sounds. An accentuation of the aortic second sound is perhaps most frequent. Well-marked valvular disease is also not infrequent.

The pulse-changes, while not very obvious, are such that anyone taking the trouble to observe a few cases thoroughly will be convinced of their existence. It is pointed out that while there are admirable descriptions of the condition of high-pulse tension as it occurs in the adult, there are none as it occurs in the young, in whom it gives rise to a different class of symptoms. That increase of blood-pressure is an efficient factor in the causation and increase of myopia, has been generally recognized and taught. But this increase has been regarded as merely local instead of general.

Dr. Batten regards myopia as more frequently acute in its onset and increase than is often supposed. He finds it closely associated with pregnancy and with certain constitutional diseases, as rheumatism, syphilis, alcoholism in young boys, typhoid fever, and phthisis—all marked by profound and general nutritive changes. The association of choroiditis with such diseases is usually recognized, and the association of choroiditis with myopia well-nigh universal. And he regards it as more rational to suppose that in the latter case both the myopia and the choroiditis are due to some underlying nutritive condition, than that the latter is due to the former. He is inclined to consider a high degree of astigmatism as having a similar origin. Eighteen cases of association of myopia with the various conditions mentioned are reported in abstract.

Blindness during Lactation.

E. Nettleship (*Royal London Ophthalmic Hosp. Rep.*, vol. xiii., part iii.) reports a group of four cases belonging to a class that he thinks can be clearly

separated from the more numerous cases in which blindness arises from albuminuria of pregnancy, or from loss of blood in the confinement, or in which there is interference with vision by impairment of accommodation. None of these cases were seen at the time of blindness, or at least at the time of recent blindness, but in some of them the appearances, when seen, pointed with more or less certainty to the previous occurrence of optic neuritis. And it was probable that neuritis might have occurred in those where the disc and retina appeared quite healthy some years after the attack. He thinks, therefore, that these cases should be associated with those in which neuritis occurs from chronic anæmia.

In the first case the blindness came on while suckling her second child, then about three months old, became complete, and lasted several weeks. But complete recovery occurred on weaning it, and there was no subsequent recurrence. She did not nurse her subsequent children. One of the eyes showed the appearances of past optic neuritis when examined several years later. In a second case there was temporary failure of vision after a first confinement; and failure again, not followed by improvement, after her second confinement, sixteen months later. The eyes several months later presented the appearances of post-neuritic atrophy. In this case neither of the children lived, and of four other pregnancies she had but one living child, raising a strong suspicion of syphilis. In the next case the blindness occurred after suckling the child eighteen months in great privation and anxiety. Complete recovery followed weaning the child, leaving no ophthalmoscopic evidence of what had occurred. In the fourth case there was blindness of many weeks during the fifth lactation, followed by complete recovery, with no changes in the fundus. There was no recurrence with a subsequent lactation. Here also there was a suspicion of syphilis. With the foregoing is reported a case of blindness after acute loss of blood, with complete recovery, and partial recurrence from a similar cause many years later. While it is quite uncertain what connection lactation has with the occurrence of such blindness, and clear that it had no connection with it in one case, it is greatly to be hoped that those who have seen similar cases, especially in the earlier stages, will report them.

OBSTETRICS.

UNDER THE CHARGE OF

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Bacteriology of the Normal and Feverish Puerperal States.

The question as to the relation of bacteria to fever, or its absence, in the puerperal state has been the subject of study by Franqué. Utilizing material in the Würzburg Klinik, he publishes in the *Zeitschrift für Geburts-*

hülfe und Gynäkolgie, Band XXV., Heft 2, a series of observations with control experiments from which he draws the following conclusions: It is possible to introduce streptococcus pyogenes into a uterus free from bacteria recently after labor without producing more than a slight rise in temperature, scarcely exceeding the normal, accompanied by a very slight disturbance in the general well-being of the patient. The *bacterium coli commune* is capable of exciting fever in the puerperal state. Sapræmia is rare in the puerperal condition. It can only be diagnosticated after bacteriological examination of the lochia, as shown in the absence of pathogenic micro-organisms and the presence of saprophytic bacteria.

A Severe Case of Osteomalacia during Pregnancy greatly benefited by Oöphorectomy.

A striking example of the benefit following removal of the ovaries in pregnant patients suffering from osteomalacia is given by Rasch in the *Zeitschrift für Geburtshülfe und Gynäkologie*, Band XXV., Heft 2. The patient was forty-one years old, and was a multigravida. The birth of her last child occurred about a year before she came under observation. The history related that since the birth of the last child there had been pain in the back and disability in locomotion. Sharp pain was complained of in the right leg; the advent of the present pregnancy made these pains much worse, and the patient soon became absolutely unable to stand and scarcely able to move. On examination, the bones of the pelvis and general skeleton were found sensitive to the touch; the pelvis was found to be contracted, the patient's urine contained neither albumin nor sugar, her temperature after entering the hospital was usually 102°. Labor was then induced, and twins were delivered. The birth of the children, however, produced no improvement in the pain. The abdomen was accordingly opened, and the ovaries and tubes removed. The patient's improvement began on the third day after the operation, and continued to recovery. While the deformity remained the same, the patient was able subsequently to work, and is free from pain.

A Further Report upon Two Hundred Labors conducted Without Internal Disinfection.

Mermann reports (*Centralblatt für Gynäkologie*, 1893, No. 9) two hundred cases of labor conducted without internal disinfection. These cases comprised the application of the forceps four times, one case of perforation and extraction with the cranioclast, one embryotomy for neglected transverse presentation, six versions, comprising placenta prævia and other abnormalities, one case of decomposed hydrocephalus treated by puncture, five cases where the dead fœtus was slightly decomposed, and three breech presentations terminating normally. Other abnormalities of labor presented, making an interesting collection of cases. None of these cases died, nor was any one of them severely ill. Mermann's cases now number nine hundred without a death from septic infection, but one death having occurred, and that from rupture of the uterus in placenta prævia. But fourteen of these two hundred patients showed any considerable rise of temperature. Mermann

concludes from these cases that thorough, painstaking antisepsis applied to the external parts gives a mortality of *nil;* that under normal circumstances not more than one per cent. of rise of temperature after labor can be referred to affections of the external parts; three-fourths of one per cent. being caused by ptomaïne infection; one-fifth of one per cent. of fever by pathogenic organisms already contained in the body; that when antisepsis is practised rigidly, but internal examinations are made, three per cent. of all rises of temperature result from small injuries received during the examination. Under these precautions, infection of the external parts is practically nothing.

Ischio-pubiotomy.

In the *Nouvelles Archives d' Obstétrique et de Gynécologie*, 1893, No. 1, Pinard reports a case of Farabeuf's operation known as ischio-pubiotomy. The patient was a multipara, thirty-two years of age, who had borne children normally, and had also had difficult labors. On examination, she was found to have a contracted pelvis whose antero-posterior diameter measured eight centimetres. The pregnancy was allowed to go to term, and when the first stage was well completed, the ischio-pubic branch and the horizontal portion of the pubis, five centimeters from the median line, were severed and the fœtus delivered with Tarnier's forceps. A chain-saw was used in severing the parts. A considerable hemorrhage was checked by hæmostatic forceps. An enlargement in the size of the pelvis occurred after the section, varying from two to four centimetres in extent. After the delivery it was found unnecessary to suture the parts, as the cut edges remained in apposition. The only complication in the case was the occurrence of a sacral bedsore following the prolonged maintenance of the dorsal position.

The Effect of Purgatives, administered to the Mother, upon the Nursing Infant.

In the *Practitioner* for March, 1893, Gow reports the results of observations in the use of purgatives with nursing mothers. The drugs used were aloes, senna, cascara sagrada, and sulphate of magnesium. It was impossible to trace the direct action of senna, cascara sagrada, and aloes upon the infant when given to the mother, there being no direct evidence that they at all affected the bowels of the child. Sulphate of magnesium frequently caused looseness in the bowels of the infant.

[A recent experience has exemplified the truth of these observations. It was necessary to administer to a healthy primipara sulphate of magnesium, which acted upon the child's intestines much more promptly than upon those of the mother. A similar experience was met with when other purgatives, notably aloes, were tried with the same patient.—Ed.]

Dystocia caused by Great Distention of the Fœtal Urinary Bladder.

An instance of this remarkable complication is given by Schwyzer, of Zurich, in the *Archiv für Gynäkologie*, Band xliii., Heft 2. The patient was a multigravida whose labor-pains failed early in labor. A small amount of

amniotic liquid had escaped, although she knew no reason for the rupture of the membranes. The abdomen was distended, and fœtal parts could be felt with difficulty. The face was presenting, dilatation being complete, and a considerable tumor was felt upon the face. Closer examination revealed the fact that the head was too small for that of a fœtus at term; the uterus showed well-marked fluctuation, and palpation was obscure. The patient was taken to a hospital, and the forceps applied under anæsthesia. It was necessary to perform embryotomy, amputating an arm, opening the abdomen, and puncturing a collection of fluid. The free escape of a clear fluid, colored with blood, followed; examination of the body of the fœtus revealed an enormous distention of the urinary bladder, causing a cyst, which had been the hindrance to birth. Among others, SCHROEDER reports (*Lehrbuch der Geburtshülfe*, 1891) twelve similar cases.

TUBERCULOSIS OF THE PLACENTA.

AN example of this interesting and unusual condition is reported by LEHMANN in the *Deutsche medicinische Wochenschrift*, 1893, No. 9. The mother was aged twenty-six years, and complained of cough, headache, and general malaise. Six of her brothers and sisters died of pulmonary tuberculosis. The patient had borne a child after normal pregnancy, which perished of some disease of the head. Physical examination of the patient pointed to acute miliary tuberculosis or, possibly, malignant endocarditis. The patient perished a few days after coming under observation, but not until tubercle had been discovered in the choroid. Post-mortem examination revealed disseminated miliary tuberculosis in the mother. Examination of the body of the fœtus failed to reveal lesions characteristic of acute tuberculosis. On the other hand, however, the placenta was found unmistakably tuberculous. An abundance of decidua cells was observed which were infiltrated with tubercle; also, in the chorion the sheaths of the small vessels were found infiltrated with tubercle bacilli.

A NEW METHOD OF ARTIFICIAL RESPIRATION IN ASPHYXIA NEONATORUM.

DEW describes in the *Medical Record*, March 11, 1893, a procedure for resuscitating an asphyxiated infant, which is as follows:

Grasp the infant with the left hand, allowing the neck to rest between the thumb and forefinger, the head falling far over backward; the mouth is straightened and also the larynx, the upper portion of the back and scapulæ resting in the palm of the hand; the other three fingers to be inserted in the axilla of the baby's left arm, raising it upward and outward. With the right hand the knees are so grasped that the right knee rests between the thumb and the forefinger, the left between the fore and middle fingers, this position allowing the back of the thighs to rest in the palm of the operator's hand. If the child is small, it will be found more convenient to grasp it by the ankles, allowing the calves, instead of the thighs, to rest in the palm of the hand. The next step is to depress the pelvis and lower extremities, so as to allow the abdominal organs to drag the diaphragm downward, with the left hand gently bending the dorsal region of the spine backward. This pro-

duces inspiration. The reverse of this movement, bringing the head, shoulders, and chest forward, causes expiration. If the thighs are brought forward upon the abdomen, the lumbar region is arched backward and the child so bent upon itself as to produce a powerful expiration.

Cæsarean Section for Rhachitic Deformity of the Pelvis.

Griffith, of St. Bartholomew's Hospital, reports (*British Medical Journal*, 1893, No. 1682) a case of Cæsarean section for rhachitic deformity. The patient was a primipara with marked lordosis, who showed a considerable contration in the pelvis, the external conjugate being five and one-half inches; the true conjugate was estimated to be two and one-half inches. The sacrum was convex from above downward and from side to side. The operation was performed without especial difficulties. After the usual operation, which resulted in the extraction of a well-developed male child, the uterus was sutured with silver wire, twelve sutures being used in the body and four thinner in the upper part of the cervix. The oviducts were ligated in the middle with fine silk. The progress of the case was uneventful, recovery promptly ensuing.

Four Cases of Cæsarean Section.

Schwartz (*Centralblatt für Gynäkologie*, 1893, No. 11) reports four cases of the Cæsarean operation for contracted pelvis.

The first had a conjugata vera of six cm. and a symmetrically contracted pelvis through which the fœtal head could not pass. The operation was done early in the first stage of labor. The elastic ligature was used to prevent hemorrhage; the uterine incision was closed with silk prepared with corrosive sublimate. A good recovery from the operation followed.

A second was a Porro operation; the pelvis was symmetrically contracted. The patient had suffered from pleuritis some months before the operation, and fourteen days after the operation this disease proved fatal. The autopsy revealed extensive exudate in both pleural sacs and consolidation of the lungs.

The third case revealed scoliosis of the spine and other signs of rhachitis. The pelvis was of the flat rhachitic type. The circumference of the abdomen was very large, the uterus lying in the anterior portion of the tumor. When labor occurred the uterine contractions were not successful in bringing the head to engage. The Cæsarean operation was performed. The patient perished of septic peritonitis. The post-mortem revealed the fact that two stitches through the muscular layer had torn out and that the lochia had escaped into the abdomen.

The fourth patient was a case of marked kyphosis and lordosis of the spine. The pelvis was flattened. Silk was used to close the uterus and a drainage-tube was inserted within the cervix and vagina. Although all possible antiseptic precautions were taken, the patient perished three days after the operation from acute sepsis. The post-mortem examination revealed the uterine incision closed; the source of the septic infection was found in the three lower lumbar vertebræ, where caries was present.

Two Cæsarean Sections.

Simon (*Münchener medicinische Wochenschrift*, 1893, No. 11) reports two cases of Cæsarean section, as follows:

The first had been delivered in a former pregnancy by craniotomy upon the living child. The patient had a highly contracted pelvis with a very thick and heavily ossified symphysis. The child was asphyxiated, but was revived. The placenta was firmly adherent and required considerable effort to remove it. The uterus was closed with silk and the peritoneum was united with fine silk. Considerable blood escaped from the uterus, ceasing on the use of ergot. The mother's recovery was uncomplicated.

The second case was that of a strong peasant woman whose skeleton showed no signs of rhachitis. She suffered, however, from double congenital dislocation of the hip-joints; the pelvis was symmetrically contracted. At the operation the placenta was found on the anterior wall of the uterus and was separated at the incision; the uterus was closed with silk and the peritoneum separately by the same material. Uninterrupted recovery followed the operation.

GYNECOLOGY.

UNDER THE CHARGE OF

HENRY C. COE, M.D., M.R.C.S.,
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The Use of Ichthyol in Gynecology.

Hermann (abstract of thesis in *Centralblatt für Gynäkologie*, 1892, No. 50) reports the result of observations in 150 cases in which he tested the action of ichthyol, either pure or in watery solution, in order to eliminate the possible influence of glycerin upon the local disease. All other treatment (hydrotherapy, massage, etc.) was suspended. He finds that the drug has a distinct absorptive and analgesic influence in all varieties of pelvic inflammation, with or without exudation. He found it particularly valuable in cases of carcinoma of the uterus, establishing a differential diagnosis between cancerous and inflammatory indurations, the latter being speedily affected by its use. Pure ichthyol also proved to be valuable as an application to the eroded cervix, and ichthyol ointment (50 per cent. in lanolin) in cases of fissured nipple.

Ovariotomy in Japan.

Omori and Ikeda, of Fu Kuo Ka, Japan (*Centralblatt für Gynäkologie*, 1892, No. 52) report one hundred ovariotomies, with five deaths, two of which were from complications not due to the operation. Among the tumors thirty-six were dermoid cysts—an unusual proportion, since Spencer Wells

encountered only twenty-two in one thousand ovariotomies. The authors can only explain their unique experience on the theory that among Japanese women the ovaries are especially predisposed to the development of dermoids.

Cœliotomy for Peritoneal Adhesions.

Tipjakoff (*ibid.*) reports the following cases, in which he opened the abdomen on account of persistent abdominal pain:

Case I. Unmarried girl, aged eighteen. A year and a half before she took cold at a menstrual period, and had an attack of localized peritonitis. Since that time she had complained of unbearable pain in the abdomen, with loss of appetite, constant vomiting, and obstinate constipation. On examination, the pelvic organs were found to be fairly normal, but the uterus was only slightly movable. The diagnosis of general intestinal adhesions within the pelvis was made, which was confirmed by operation. These were separated, as well as a firm adhesion of the omentum. The patient made a good recovery, and remained free from pain and vomiting, while her bowels moved normally.

Case II. A widow, aged thirty-eight, had suffered for three years with severe abdominal pains and obstinate constipation, also constant metrorrhagia, her symptoms being referred to a blow which she had received. Her uterus was anteflexed and immovable, and there was general tenderness over the vaginal vault. Cœliotomy revealed firm adhesions of the omentum and intestines to the abdominal parietes and pelvic organs. After recovery from the operation there was marked improvement in the patient's condition, and the uterine hemorrhage ceased, the latter having doubtless been due to hyperæmia resulting from the venous obstruction caused by the adhesions.

Case III. The patient, aged forty-two, who had formerly been a prostitute, complained of uterine hemorrhage and constant abdominal pains. The uterus was anteflexed and fixed, and the abdomen was extremely tender. Preliminary curettage was performed, followed by cœliotomy and the separation of firm intra-pelvic omental and intestinal adhesions. The patient made a good recovery and was entirely relieved.

The writer reviews the effect of adhesions in disturbing the intra-peritoneal circulation and preventing the normal movements of the viscera, with the result of causing functional disturbances, intestinal obstruction, and secondary disease of the pelvic organs. He believes that in working women, who suffer so severely as to disable them, cœliotomy is clearly indicated.

[We regret that the writer does not throw any light upon the question of the re-formation of adhesions after they have been separated, since many surgeons have not met with his success in the *permanent* relief of the distressing symptoms mentioned.—H. C. C.

The Action of Morphine on the Female Pelvic Organs.

Passower (*Centralblatt für Gynäkologie*, 1893, No. 2) affirms that the habitual use of morphine causes atrophy of the pelvic organs, and cites in support of this opinion the cases of two young women whom he kept under careful observation. In one instance amenorrhœa persisted until the use of

the morphine was stopped, when menstruation reappeared, and again ceased when it was resumed. Atrophy of the vulva took place, and the depth of the uterus within two years and a half diminished from three to less than two inches. The amenorrhœa was probably an indication that the atrophic process began in the ovaries, and subsequently involved the other genital organs. An analogy is seen in Claude Bernard's experiments upon dogs, in which atrophy of the submaxillary glands followed the prolonged administration of morphine.

Bacteriological Examinations in the Newborn.

Strogonoff (*ibid.*), from a series of examinations of the genital organs in newborn female infants, arrives at the following conclusions: 1. Immediately after birth the utero-vaginal canal contained no micro-organisms. 2. After the first bath microbes were found in the vagina, doubtless introduced through the water and oil inunction. 3. Early infection probably occurs most frequently in cases of breech-presentation. 4. In no instance were the microbes of a specific or infectious character. 5. In general, the vagina of newborn infants furnishes a favorable nidus for the development of micro-organisms.

Gonorrhœa in the Female.

Witte (*Centralblatt für Gynäkologie*, 1893, No. 4), from the study of a large number of cases, arrives at the following conclusions: 1. Vulvo-vaginitis in children is frequently due to gonorrhœa. 2. Gonorrhœa often remains localized in the vagina, and is cured by simple cleanliness alone. 3. Bartholinitis is more commonly due to puerperal infection, or to syphilis, than to gonorrhœa. 4. Granular vaginitis is a rare complication. 5. So long as suppuration does not occur, gonorrhœal salpingitis readily yields to ordinary treatment.

The Ischio-rectal Incision in Vesico-vaginal Fistula.

Michaux (*Centralblatt für Gynäkologie*, 1893, No. 5) advises that in cases of inaccessible vesico-vaginal fistula the patient be placed in Sims's position, and that an incision be made parallel with the cleft between the nates, beginning opposite to the anus and ending where the labium majus crosses the pubic ramus. The ischio-rectal fossa is opened without much bleeding, and the vagina is then incised to the extent of three or four inches, opposite to the fistula, which is thus easily exposed and closed in the usual manner. The vaginal wound is then united by a continuous catgut suture, and the wound in the ischio-rectal fossa is closed, with a strip of iodoform at its lower angle for drainage. In thin subjects the operation is easy, and in stout women no more difficult than the ordinary method.

Castration for Functional Neuroses.

Playfair (*Trans. London Obstet. Soc.*, vol. xxiii, part i.) arrives at the following conclusions as the result of his personal experience: 1. The removal of the adnexa is not justifiable in cases of pure functional neurosis.

2. Even when appreciable disease of the tubes and ovaries is present an operation should not be performed until palliative treatment has first been tried. 3. The results in hystero-epilepsy and hystero-mania are so uncertain that cœliotomy is not to be advised.

The consensus of opinion was entirely in favor of the author's conclusions, Spencer Wells being especially emphatic in his denunciation of operative interference.

The Influence of Purpura Hæmorrhagica upon Menstruation and Pregnancy.

Phillips (*ibid.*) says that the prognosis in these cases is nearly always bad, death being due to anæmia or sepsis. Abortion is the usual result of pregnancy in such patients. There is usually no evidence of definite pelvic trouble.

Premature Sexual Development in Connection with Ovarian Tumors.

Croom (*Edinburgh Medical Journal*, February, 1893), after reviewing carefully the literature of ovarian tumors in children, reports the following interesting case: A girl, aged seven years, was admitted to the hospital in November, 1892. She had been perfectly well in May, but since then had been raped by a boy on several occasions, in consequence of which she had had persistent uterine hemorrhage. Shortly after the first coïtus her abdomen began to enlarge; when examined, seven months later, it presented the ordinary appearance of pregnancy at that period. The breasts were enlarged to the size of an orange, the areolæ being marked. The mons was unusually prominent and was covered with hair. There was a distinct median line of pigmentation on the abdomen, and a bruit could be heard over the tumor. The diagnosis of pregnancy was first entertained, but an examination under chloroform showed that while the cervix was large, soft, and patulous, a sound entered the uterus to the depth of a little over three inches, its withdrawal being followed by profuse hemorrhage. The tumor seemed to be separate from the uterus.

Ovariotomy was performed, a round-celled sarcoma, weighing six pounds, being removed from the left side. The patient made a good recovery, and when examined two months later presented an entirely different appearance. The breasts had diminished in size, the areolæ having disappeared; the labia minora were smaller, and the vaginal mucosa, previously dark and congested, had resumed its normal aspect. The cervix was small, the os closed, and the sound passed to the depth of only two inches, no hemorrhage resulting from its insertion. The writer infers that the unusual development of the genital organs was directly due to the stimulus of repeated acts of sexual intercourse in a subject who was naturally precocious.

The Biology of Uterine Fibro-myoma.

Kleinwächter (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xxv., Heft 2) from an analysis of forty cases of fibro-myoma confirms the statements of former observers without adding many new facts. The age of a tumor,

he says, cannot be inferred from its size, since after growing slowly for a long period it may suddenly begin to increase in size, reaching large dimensions in a few months. It is exceptional for a fibroid to cease growing before the menopause, nor does this period exert such a favorable influence in causing these neoplasms to disappear as was formerly supposed. Sometimes they grow more rapidly than before, and tend to undergo malignant degeneration.

The variations in size of fibroids probably depend upon either the original site of the tumors or their germs, as well as on individual peculiarities of their tissue, as suggested by Gusserow. A given tumor may also have received increased nutrition through vascular pseudo-membranes. Inflammatory processes around the uterus, as well as in the deeper layers of the muscular wall of the organ, undoubtedly exert some influence upon the growth of the tumor.

Vaginal Hysterectomy and High Amputation in Carcinoma Uteri.

Tipjakoff's statistics (*Centralblatt für Gynäkologie*, 1892, No. 43) are unusually good. In 50 cases of malignant disease of the uterus treated during the years 1891 and 1892 (35 of the cervix, 12 of the body, and 3 of adenoma uteri) he performed simple amputation of the cervix 5 times, high amputation 25 times, and vaginal hysterectomy 20, without a death. He prefers complete extirpation when the entire cervix is diseased, but regards it as indispensable that the uterus should be movable, with no evidences of infiltration in the parametria. His technique does not differ from that usually followed. He employs silk ligatures entirely, and nearly always uses gauze drainage, changing the gauze on the fourth day.

[These statistics are particularly valuable, not only because of their excellent showing, but by reason of the fact that the operator is not wedded to any particular method, performing either extirpation or high amputation according to the existing indications.—H. C. C.]

Recurrence after Extirpation of the Cancerous Uterus.

Weil (*Prager med. Wochenschrift*, 1893, No. 6) believes that cancer is inoculable, as shown by clinical evidence in the case of malignant disease of the cervix uteri. It is highly probable that raw surfaces may be thus inoculated during an operation by the contact of an instrument which has been applied to the cancerous tissue. It is, therefore, not enough to absolutely exclude sepsis in total extirpation, but to prevent the inoculation of healthy tissue with cancer-germs during the operation by previous thorough curettage and cauterization, and by exercising great care that no instrument which has touched the neoplasm shall come in contact with the wound.

Cyst of the Pancreas Simulating Ovarian Cyst.

Hersche (*Wiener klin. Wochenschrift*, 1892, No. 51) reports the following interesting case: A multipara, aged thirty-two years, had noted for five years a tumor the size of an apple to the left of the umbilicus, unaccompanied by pain or a history of previous injury or inflammation of the

gastro-intestinal tract. It diminished in size, but again resumed its original dimensions. On examination it was felt through the anterior vaginal fornix to the left of the uterus, and indistinct fluctuation could be obtained. The diagnosis of ovarian cyst was made, and cœliotomy was performed. The pelvic organs were found to be normal, the tumor being a cyst which sprung from the tail of the pancreas and was so adherent toward the vertebral column that it could not be enucleated. Nearly two quarts of chocolate-colored fluid were withdrawn and the edges of the cyst were stitched to those of the wound. The patient made a good recovery and was quite well six months after the operation.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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Emphysema of the Lung.

The exact pathology of emphysema of the lung has been shrouded in an obscurity quite remarkable in view of the great frequency of the disease. The old idea, that the trouble was merely a dilatation of the air-vesicles as the result of long-continued and excessive intra-alveolar pressure, has gradually been abandoned. We now know the increased size of the air-spaces to be due to disappearance of the alveolar walls separating adjoining air-vesicles, and their resulting mergence.

Fastening upon two constantly noticed characters of the lesion as observed by him (its greater intensity on the surface of the lung, particularly at the edges, and the disappearance of anthracotic pigment from the emphysematous areas), Grawitz (*Deutsche medicinische Wochenschrift*, 1892, No. 10, 201) is led to the belief that the disease is primarily a degeneration of the connective tissue of the alveolar wall dependent upon defective nutrition, either as the result of defective blood-supply, inflammation, or senile decay. Three forms of the disease are distinguished in accordance with their different modes of production.

The experimental production of the first of these varieties was observed by Grawitz in rabbits which had been made to inhale phosphoretted hydrogen. This poisonous gas induced œdema of the lungs, which, in a few days, led to marked degeneration of the connective tissue of the alveolar walls, and later, union of adjoining air-vesicles with the formation of an emphysema typical in every respect. To this form of emphysema he applies the adjective "hydropic," and he believes it to be the form of the disease which, in man, so

frequently complicates disease of the kidneys and heart, with resulting impairment of the pulmonary circulation.

The second form of the disease is called by Grawitz "inflammatory." It is thought to depend upon degeneration of the connective tissue of the lung consequent upon chronic inflammation. The author has elsewhere shown that degeneration of connective tissue is accompanied by gradual disappearance of the fibrous element and return to a more cellular condition. This implies loss of strength, and it has also been shown that the connective-tissue cells, under these circumstances, are capable of becoming wandering cells, and frequently show a tendency to remove dead tissue or foreign particles. These cells, containing anthracotic pigment, have been observed by Grawitz in the lymph spaces of the lung in his cases of emphysema, and he believes the disappearance of pigment from the emphysematous areas to be due to their phagocytic action.

The third variety of emphysema, the "senile" or "atrophic" form, is thought to be only a part of the general degenerative process throughout the body. Impairment of circulation and inflammatory changes are not infrequently also associated in its production, but it is not infrequently observed without these.

The Etiology of Pleurisy as it bears upon Prognosis and Treatment.

Though pleurisy may be regarded as among the best-understood diseases in so far as its pathology and symptomatology are concerned, it has few equals as regards the difficulty of rendering a correct prognosis. Why, of two cases precisely similar to all appearances, should the one quickly go on to recovery after a single tapping, while the other hangs on most persistently or develops into empyema in spite of every care on the part of the physician? Nothing is more unaccountable than the great diversity in the course of the disease under apparently identical circumstances. Furthermore, the greatest difference of opinion obtains as to the treatment best suited to its cure. Any observations, then, which may throw light upon its prognosis, and which may serve to establish its treatment upon a firm rational basis must be welcomed with more than usual interest.

The study of the past few years upon this subject has demonstrated the presence of several different species of pathogenic bacteria in pleuritic exudates, both serous and purulent, and as these observations have accumulated it has been possible to trace a relationship between the severity and duration of the disease and the species of micro-organism present. The most recent and one of the most careful of these studies is reported by Prince Ludwig Ferdinand in the *Deutsches Archiv für klinische Medicin* (1892, l. 1), and as the conclusions there reached are substantially in accord with those of most other observers, it has seemed proper to present them here somewhat in detail.

In the investigation a small amount of the exudate was withdrawn from the chest by means of an aspirator. A portion of this was examined morphologically in stained cover-glass preparations; from another portion plate cultures were made; and animal inoculations were undertaken, as a rule,

with the remainder. In this way 23 cases were examined. In 5 of these the diplococcus pneumoniæ alone was found; in 3, the staphylococcus alone; in 5, the streptococcus alone; in 2, the diplococcus and streptococcus together; in 1, the staphylococcus and streptococcus; in 2, the bacillus tuberculosis; and 5 were found to be bacteria-free.

All the cases in which the diplococcus pneumoniæ was found accompanied acute lobar pneumonia. In 2, the pleuritic exudate was serous; in 1, seropurulent and scanty; in 1, purulent from the start; and in 2, serous at first, but later purulent. In one case pericarditis was also present. In all the cases in which the diplococcus was found alone, the course of the disease was comparatively short, and recovery was rapid, though, in the two empyema cases, not until resection of a rib was performed, after waiting about three weeks in the hope that spontaneous resorption might occur.

In one case in which the examination was undertaken four days after crisis of the pneumonia, though the diplococci were seen on microscopical examination to be very plentiful in the exudate, both cultures and animal inoculations were negative, suggesting the death of the diplococci at the time of or very soon after the crisis. This observation is of interest in connection with what is known regarding the short life of the diplococcus pneumoniæ in pure cultures, and suggests a possible explanation of the shorter course and more favorable outcome of pleurisies caused by that germ.

Prince Ferdinand has found record of 200 cases of pleurisy in which the diplococcus pneumoniæ was found alone.

The etiological relationship of the ordinary pyogenic bacteria to empyema has long been universally admitted, but it is only recently that attention has been called by Levy to the fact that they may also be the cause of serous pleurisy not advancing to purulency. This observation has been confirmed by Prince Ferdinand in two of his cases in which the staphylococcus alone was found. In both of these the course of the disease was comparatively short and recovery was perfect; in the first case without operative treatment of any kind; in the second, after aspiration alone.

Of the 8 cases in which the streptococcus was found, 4 followed influenza, 2 pneumonia. In 2 the exudate was at first serous, but afterward became purulent; the others were empyemas from the start. All were severe cases, necessitating resection of ribs. Three ended fatally, and in the others convalescence was very slow.

It has long been supposed that many cases of pleurisy with effusion have their origin in a tubercular process in the pleura. Considering the difficulty attending the detection of the tubercle bacillus in such fluids, the failure to find it in suspected cases has not been regarded as opposed to this view, and recently its detection in the exudate in 31 cases of pleurisy has led some to express the belief that all cases in which bacteria could not be found in the exudate must be tubercular. While pointing out the fallacy of this extreme view, Prince Ferdinand is still forced, as the result of his studies, to admit that a very large number of such pleurisies must have such origin. In 5 of his cases in which bacteria could not be detected in the pleuritic exudate, he was able to find unmistakable evidence of tuberculosis of the lungs (physical signs, tubercle bacilli in the sputum, and, in 2 cases, autopsy), and

in 2 empyema cases, which at first failed to reveal bacteria, tubercle bacilli were discovered after more careful examination. He therefore concludes that, when there is no history of acute pneumonia or neoplasm of any kind, when there is little tendency to absorption of the exudate, and particularly if it be at the same time sanious, the failure to find bacteria in the exudate may be regarded as strongly pointing to a tubercular origin of the pleurisy.

The bearing of these facts upon prognosis and treatment is not far to seek. Prince Ferdinand groups the various pleuritic exudates in an ascending series as regards intensity as follows: 1. Serous pneumococcus exudates. 2. Serous staphylococcus exudates. 3. Pneumococcus empyemas. 4. Staphylococcus empyemas. 5. Streptococcus empyemas. A bad prognosis also naturally attaches to exudates resulting from tuberculosis and sepsis.

The streptococcus exudates, being the most severe, should be radically treated by early resection, even though they be serous at first, for they will most certainly later become purulent. Unless thus early and vigorously treated these cases are apt to prove very severe, and often fatal as the result of septic absorption.

In the case of the staphylococcus exudates the problem is somewhat more difficult, as the prognosis is much less certainly bad. Aspiration and careful observation of the course of the disease are here recommended, when the exudate is serous. If it become purulent, however, it may justly be considered that the process is becoming more intense, and resection is then indicated.

When the diplococcus pneumoniæ is determined to be the cause of the exudate, whether serous or purulent, the prognosis may be regarded as good, other things being equal, and Prince Ferdinand recommends waiting for about three weeks before resorting to radical operative treatment, in the hope that spontaneous absorption may take place. Even then he advocates thorough thoracentesis first, trusting that no second accumulation of pus may occur. If this, however, should result, nothing remains but resection, and a speedy cure may be expected after thorough drainage of the chest.

In conclusion, Prince Ferdinand strongly urges the bacteriological examination of the exudate in all cases of pleurisy, and the importance of making the treatment accord with the information so obtained.

It may be questioned whether Prince Ferdinand's statement, that the exudate in streptococcus pleurisies inevitably becomes purulent, is not somewhat too sweeping, as Goldscheider (*Zeitschrift für klinische Medicin.*, 1892, xxi. 363) has recently reported three such cases in which the exudate remained serofibrinous throughout the course of the disease, at no time being purulent. There can be no doubt, however, of the correctness of Prince Ferdinand's conclusion as to the comparative severity of the streptococcus cases, and the need of earlier and more radical treatment for them.

Myositis Ossificans.

Stonham (*The Lancet*, December 31, 1892, No. 1485) couples with the report of a case of this rare disease a summary of its principal features as heretofore described, giving also a very full bibliography of the published cases.

The lesion consists in the formation of dense deposits of a bony nature in

the skeletal muscles, with consequent degeneration of the muscle tissue and immobility. The process usually begins during youth and is steadily progressive. The muscles of the neck, shoulders, and back are those first affected in most cases; later, those of the chest and extremities. The body may finally be rendered quite rigid.

Heredity seems to have no part in the production of the disease, nor can any distinct etiology be formulated further than that when the disease is once fairly under way slight injury seems to determine the formation of new foci of the process. The viscera usually remain in good condition.

Death often occurs from pulmonary complication (pneumonia or tuberculosis), or from suppuration about the ossific deposits, with secondary septic absorption. Treatment is found to be useless.

POLLARD, in the same number of *The Lancet*, presents the history of a case of myositis ossificans, typical in every respect, in which he attempted to give relief by removal of portions of the bony tissue. Temporary benefit resulted, with partial restoration of motion, but this was of short duration only, fresh deposits forming at the site of operation.

TUBERCULOSIS AMONG CATTLE.

RIECK (*Viertjelahrsschrift für gerichtliche Medicin und öffentliches Sanitätswesen*, 1892, No. 4) presents the results of the examinations made at the Leipzig abattoir as regards tuberculosis during the years 1888 to 1891, inclusive. During this time 67,077 cattle were slaughtered, of which 20.4 per cent. were found to be tubercular. The increased proportion of tubercular animals during the latter part of this time is explained by the fact that the examination has latterly been much more searching. In 1891, 26 per cent. of the animals were reported as tuberculous.

[It is hardly to be supposed that the large proportion of tubercular animals observed in Leipzig obtains everywhere, but that one-quarter of those slaughtered *anywhere* in one year should be tuberculous suggests a very considerable prevalence of the disease among cattle *everywhere*, and this is verified by experience. It is much to be regretted that so little supervision of our slaughter-houses is deemed necessary. Until we systematically attack every known source of infection of tuberculosis we can hardly expect to witness much reduction of its ravages among human beings. The fact that 15 per cent. of the community are its victims, classes failure to employ every known means of prophylaxis in the category of criminal negligence.]

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